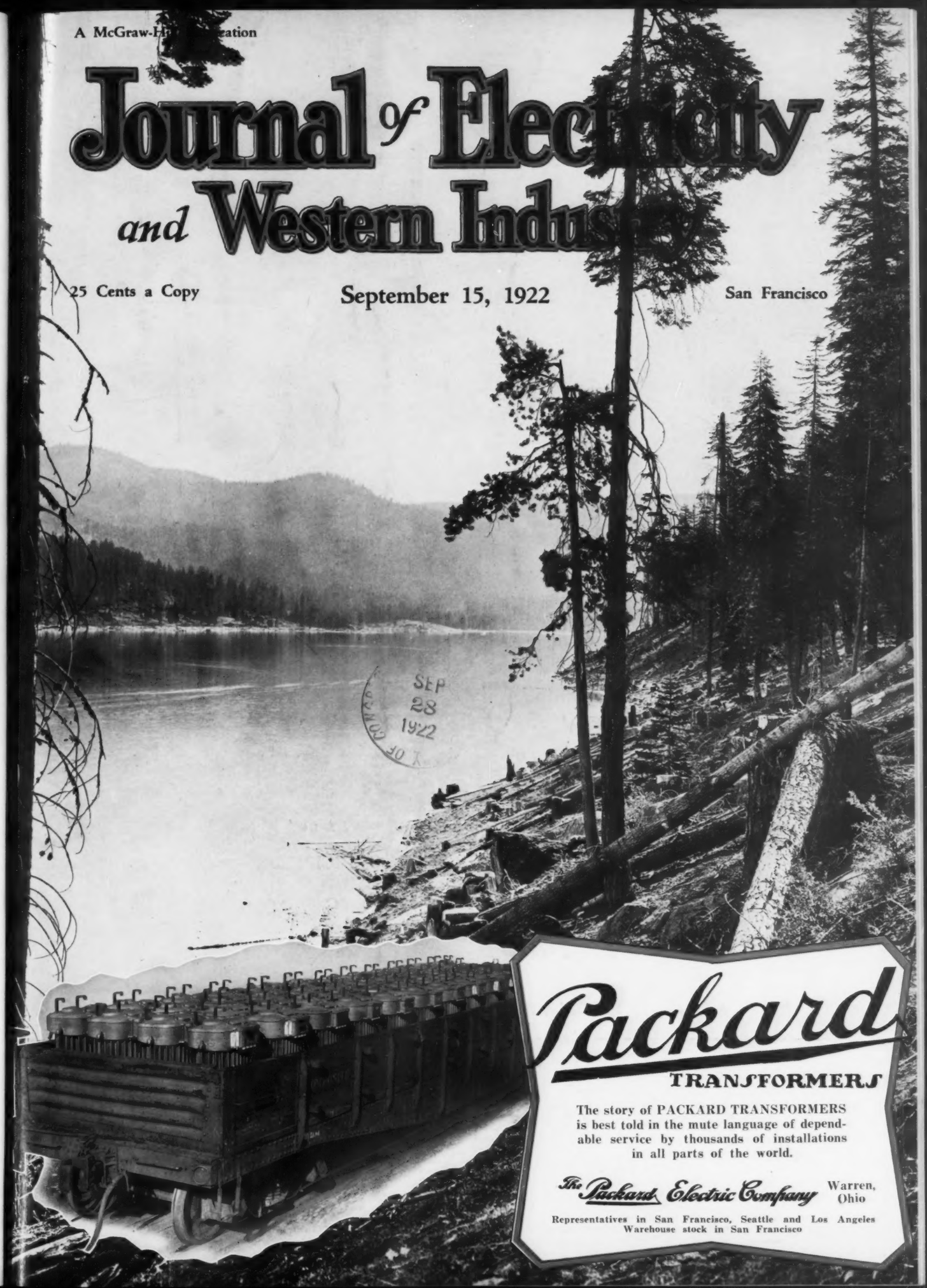
A McGraw-Hill Publication

Journal of Electricity and Western Industry

25 Cents a Copy

September 15, 1922

San Francisco



Packard
TRANSFORMERS

The story of PACKARD TRANSFORMERS is best told in the mute language of dependable service by thousands of installations in all parts of the world.

The Packard Electric Company Warren, Ohio

Representatives in San Francisco, Seattle and Los Angeles
Warehouse stock in San Francisco

PINCO

"The Correct Design"

SUSPENSION UNIT

An Integral Part of "The Perfect Line"

BUILT ON KNOWN PINCO PRINCIPLES

PIN TYPES UP TO AND INCLUDING 88,000 VOLTS

Send for Descriptive Bulletin

MANUFACTURED BY
PORCELAIN INSULATOR CORPORATION
LIMA, N. Y., U. S. A.

Pacific Coast Distributers

Baker-Joslyn Company

330-332 Azusa St.
LOS ANGELES

183-199 First Street
SAN FRANCISCO

2424-28 First Avenue South
SEATTLE

Journal of Electricity and Western Industry entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879.
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

Journal of Electricity and Western Industry

A McGraw-Hill Publication

Founded 1887

ROBERT SIBLEY, Editorial Director

Associate Editors:

Norman S. Gallison Clotilde Grunsky George C. Tenney

VOLUME 49 SAN FRANCISCO, SEPTEMBER 15, 1922 NUMBER 6

Contents

EDITORIALS 191

Price—or Adequate Service?—Development of Automatic and Remote Controlled Generating Stations—Death Knell of Socialistic Amendment Is Sounded—Placing House Numbers on Curb Is Found Successful—Attorney-General Daugherty's Declaration of American Principles—Experiments Indicate Improvements in Impulse Wheel Design—A Convention That Means Much to the West.

SPOKANE'S MODEL ELECTRICAL HOME — by R. B. McElroy 199

Over Nineteen Thousand People Visited the Electric Home Which Was Displayed by the Spokane Electrical Service League at a Cost of Approximately Five Cents per Guest.

REMOTELY CONTROLLED GENERATING STATIONS — by A. T. Parsons 203

A Description of a Semi-Automatic and an Automatic Generating Plant Installed in San Antonio Canyon by the Ontario Power Company, with an Introduction by Charles P. Steinmetz.

RELATION OF THE CHAIN STORE TO MANUFACTURER AND RETAILER — by E. A. Kincaid 206

The Fourth of a Series of Articles Devoted to an Analysis of the Modern Tendencies in the Marketing of Products and the Advantages of Different Types of Distribution Methods as Applied to Various Classes of Goods.

SOURCES FROM WHICH LABOR MAY BE RECRUITED — by George H. DeKay 209

The Advantages and Disadvantages of the Various Means of Securing Employes of All Types. A Systematic Investigation of Employer's Demands Will Eliminate Promiscuous Searches.

Western Comment on Current Events 194
Letters to the Editor 196
Eliminating the Waste in Industry 211
Western Dealer, Jobber and Agent 213
Activities of the West 216
Meetings of Interest to Western Men 221
Personals 222
Manufacturer, Dealer and Jobber Activities 224
Business Outlook in Western Market Centers 225
Construction News and New Industrial Developments 226

PUBLISHED SEMI-MONTHLY BY

McGRAW-HILL COMPANY OF CALIFORNIA — Rialto Building — SAN FRANCISCO

James H. McGraw, *President*

C. T. Hutchinson, *Vice-pres. & Gen. Mgr.*

C. M. Lindsay, *Vice-pres. & Treas.*

WASHINGTON, Colorado Building
CHICAGO, Old Colony Building
PHILADELPHIA, Real Estate Trust Building
CLEVELAND, Leader-News Building
ST. LOUIS, Star Building
NEW YORK, 10th Ave. and 36th St.

Copyright, 1922, by McGraw-Hill Company of California.

Entered as second-class matter Feb. 17, 1921, at the Post Office at San Francisco, California, under Act of March 3, 1879.

McGRAW-HILL CO., Inc., New York
Publishers of
American Machinist—European Edition
(Published in London)
Industrial Engineer
(Published in Chicago)
Chemical and Metallurgical Engineering
American Machinist Ingenieria Internacional
Electrical World Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation Engineering News Record
Coal Age Electrical Merchandising Power

Subscription rates in United States, Canada, Mexico, Cuba, Porto Rico, Hawaii, Philippines, Canal Zone, Honduras, Nicaragua, Peru, Colombia, Bolivia, Dominican Republic, Salvador and Shanghai, China, $2.50 per year. Elsewhere, $4 Gold, (17 shillings). Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.

Member Audit Bureau of Circulation.
Printed in U. S. A.

Crawford Ranges

The New Ambassador Apartments, a nine-story building in Portland, Ore., containing 49 five-room apartments of the most modern type. The Portland Railway Light & Power Co. installed in each home an 18-70 Crawford Electric Range.

An excellent example of Domestic Load

FRANKLIN T. GRIFFITH, president of the Portland Railway Light and Power Company, made the statement in late 1921 that "the outlook for the electrical industry in Portland and vicinity is encouraging. The use of electrical energy is steadily increasing. The most marked increase in consumption during the past year and in immediate prospect, has been and will be in further development of the use of energy in the homes of the people."

When he made that statement he had in mind just such use of energy in the home as the installation of 49 new Crawford Electric Ranges in this splendid new Portland apartment building. For that installation translated itself at once into a sharp upward trend and a steady new plateau in the domestic load curve.

This installation would not have been made with Crawford Electric Ranges unless experienced commercial men and electrical experts had been convinced, by severe test and tangible demonstration that "The Crawford Made Electric Cooking Perfect."

The Crawford Electric Range will supply a tonic to your domestic load curve.

The Crawford Plan gives every central station executive a chance to combine his energy with our own to further the use of electricity in the homes of the people. It's a plan to sell the best range in the best way. Have you seen it?

WALKER & PRATT MFG. CO., BOSTON

Pacific Coast Representative: Burton Y. Gibson, 680 Folsom St., San Francisco

DISTRIBUTED BY

Western Electric Company
INCORPORATED

OFFICES IN ALL PRINCIPAL CITIES

©CLB547940
SEP 25 '22

Journal of Electricity and Western Industry

A McGraw-Hill Publication

Vol. 49, No. 6 SAN FRANCISCO, SEPTEMBER 15, 1922 Per Copy, 25 Cents

Price—or Adequate Service?

PROGRESS in the electrical industry waits on the application of more fundamental knowledge to the merchandising of appliances. The consensus of opinion among men who have studied conditions is that the electrical merchandising business is suffering from undernourishment while in its infancy. In fact, many of the subsequent ailments can be traced directly to this condition.

PIONEERING in the matter of informing the public in the uses and economies of certain electric devices has largely been undertaken by power companies. Load-building was the sole aim and little thought was given to future merchandising possibilities. Appliances were offered on a price basis, and the result has been that proper consideration has never been given by the manufacturer to the margin which should be allowed between the dealers' cost and the cost to the consumer.

NO merchandising effort can be successful unless the spread between producer and consumer is sufficient to cover the costs of an adequate organization of distribution, plus a reasonable profit to the essential agencies of distribution. These costs are of necessity higher in the electrical business than in many others. There is a high sales resistance. No class of merchandise requires more intelligent or high priced sales effort; few, if any, require more servicing; and to secure volume of business, deferred payments with consequent collecting and financing are unavoidable.

THE development of a large number of prosperous, aggressive dealers will not become universal until the business is demonstrated to be sufficiently profitable to attract the highest type of merchandising brains. It must first be determined just what it does cost to sell electrical appliances and apparatus. Also, study could well be made of the experience of other industries, such as the phonograph industry, which has been successful in a big way. Much could be gained by a comparison of the costs, spreads, and retail selling prices.

SOME manufacturers have realized the need and are establishing their prices with a spread calculated to give better results. Jobbers have made much progress in cost accounting methods through their national association, but retailers in general display an amazing lack of knowledge of their costs of doing business. The problem is one which should command for its solution the concerted efforts of all branches of the industry. There must be coordination and a more general recognition of the necessity of a sufficient spread that proper service may be rendered.

UNTIL the facts are known, nothing can be accomplished. We have confidence in the ability of the men of the electrical industry to establish speedily policies based on sound economic principles, when the need is apparent.

Development of Automatic and Remote Controlled Generating Stations

AUTOMATIC and remote controlled hydroelectric generating stations are a development in the science of electrical engineering which is destined to prove increasingly important. From a technical viewpoint, there is no limit to the capacity of generating stations for which automatic control equipment can be adapted. However, in a large station the cost of operation becomes a small part of the total cost of energy, and complicated switching systems often require high-class operators.

Automatic equipment may be used in medium sized plants, as large as 12,000 kva., especially when feeding into a large system. Operation is simplified and apparatus is protected to such an extent that one watchman of little technical ability is required for general duties around the plant. But the greatest field is that of the small plants auxiliary to a larger system, for in such plants no operators need be stationed. A periodic inspection is the only attendance required.

In many places throughout the West there are small, undeveloped water-power sites which are capable of developing power with a comparatively small capital investment in the plant. Elimination of the cost of operating attendance would make the cost of kilowatt-hour output very attractive.

Control schemes are, in general, of two classes: First, the remotely controlled station, in which the generator leads run to the main station, where the generator is synchronized by hand; second, the entirely automatic station, where the generator is automatically synchronized into the transmission network.

An article elsewhere in this issue describes a successful station of each type, operating in California. Engineers will no doubt adopt these types of stations for the development of small sites hitherto thought uneconomical.

Death Knell of Socialistic Amendment Is Sounded

IF the recent primary election in California can be taken as a criterion of the attitude of the voters of that state on governmental extravagance, the fate of the much discussed Water and Power Act seems certain. The biggest political upset in the history of the state occurred when a candidate running on a platform of curtailment of expenses and economy defeated the incumbent governor by a substantial majority.

Propositions in the form of constitutional amendments to increase the bonded indebtedness and the tax rate will be suspiciously viewed by the average voter in California in November's election. Governmental extravagance and tax reduction are prominent and practically the every-day conversation of the man on the street.

With the unanimous condemnation of the press, with public disapproval expressed by chambers of commerce, commercial organizations, city councils and officials and others, public interest is generally aroused in the Water and Power Act. Since the average voter is inclined to vote "NO" on any proposition that he does not understand, and since even a casual perusal of the text of the amendment reveals its iniquitous provisions, it would seem that California will probably be spared the inevitable catastrophe of its passage.

Placing House Numbers on Curb Is Found Successful

SOMETHING entirely new in the way of a location for the house number has just been introduced in the West. It consists in placing the number on the side of the curbing in front of the home. This plan is of particular benefit to the person who is trying to find some particular dwelling while riding in an automobile or other vehicle, and would be worth thousands of dollars a year to merchants whose employes are called upon to make deliveries during both night and day.

Heretofore house numbers have been placed at any point that suits the personal desires of the home owner. The number of one house may be above the porch, of another on the porch railing, and of still another on one of the posts of the porch or beside the door. There has been no attempt at uniform numbering of homes. It has been done in a haphazard manner so that anyone desiring to locate the number of any particular dwelling has little idea where it may be found. If the curb home number was universally used, it would be a simple matter to locate any home at any hour.

These 6-inch numbers are stenciled on the curb with lamp-black and oil and when once placed there will last for years. Prior to the stenciling operation the curbing is cleaned perfectly with a stiff steel brush. It costs just 25 cents to have the complete number stenciled on the curb.

Attorney-General Daugherty's Declaration of American Principles

LIKE Frankenstein, the student of physiology in the romance of that name, who created a monster which committed atrocious crimes and inflicted terrible retribution upon its creator, the labor and trade unions of the country face the prospect of being destroyed by their own creations. Governmental mills as well as those of the Gods grind slowly. After what seems to many to be interminable delay Attorney-General Daugherty, in requesting a Federal injunction to protect the rail systems of the country from unlawful interference, has announced that the government of the United States is supreme.

"The underlying principle involved . . . in this action," Attorney-General Daugherty said in concluding his plea for the Federal injunction, "is the survival and supremacy of the government of the United States." His plea for the injunction, Mr. Daugherty said, was made necessary by the fact "that there comes a time in the history of all nations

when the people must be advised whether they have a government or not.

"No union or combination of unions can, under our law, dictate to the American Union," the statement continued. "When the unions claim the right to dictate to the government and to dominate the American people and deprive the . . . people of the necessities of life, then the government will destroy the unions, for the government of the United States is supreme and must endure.

"So long, and to the extent that I can speak for the government of the United States, I will use the power of the government within my control to prevent the labor unions of the country from destroying the open shop.

"When a man in this country is not permitted to engage in lawful toil, whether he belongs to a union or not, the death knell to liberty will be sounded and anarchy will supersede organized government."

No doubt this announcement came as a distinct shock to some unionists. But if the Attorney-General means what he says the back of misguided union labor domination has been broken.

Experiments Indicate Improvements in Impulse Wheel Design

FOR many years no radical changes have been made in the design of impulse wheels. Great improvements have been made in details, in governors and in auxiliary apparatus, but so far as general principles and fundamentals are concerned, one might conclude that this type of prime mover had reached its ultimate state. Such conclusions as to finality, however, are never safe. Elsewhere in this issue appears a news note describing a new departure in the design of impulse wheels. Despite the recent trend of higher and higher heads on reaction wheels and the development of higher specific speeds for impulse wheels, there is still a field ranging between heads of 800 and 1,000 ft. to which neither impulse nor reaction type is exactly suited. That is, at these heads both types have certain disadvantages or limitations. In the attempt to apply the impulse wheel to the larger units toward which modern practice is tending, certain obstacles have not heretofore been overcome. The restriction of specific speed, more particularly, imposes on the large impulse unit a low velocity with the consequent heavier machinery and increased size of power house structure. On the other hand, the Pelton wheel has distinct advantages over the reaction type when the water contains sand or other impurities in considerable quantity, or when the unit is called upon to operate part of the time under partial load. In other words, the Pelton wheel has such advantages in resisting hydraulic wear and corrosion and maintaining efficiency under varying loads that there is incentive to adapt this type to all heads. Considerable advance has been made in reaction wheel design in decreasing leakage through the clearance spaces around the runner and in prolonging the life of the seals, but the impulse turbine does not have to meet the problem of leakage at all and hence no amount of improvement can put the reaction wheel on an equal footing with the impulse type so far as this feature of design is concerned. A closer approach to the ideal type of unit than anything yet available would be a runner having the hydraulic advantages of the impulse wheel and at the same time developing the specific speeds approaching those obtainable with the reaction wheel. If and when the experiments referred to in the news note lead, as the early results indicate, to the production of units in commercial sizes that fit these requirements, the whole field of hydraulic prime movers will be affected in a most beneficial way.

A Convention That Means Much to the West

ONE of the outstanding conventions of the year, from the western viewpoint, is the eleventh annual meeting of the Investment Bankers' Association of America, which is to be held at Del Monte October 9-12. In point of numbers it will not rank high—perhaps not reaching the 1,000-mark,—but in the caliber and influence of its personnel California will not have played host to a more important group during 1922.

For many months western men in the investment securities field have been carefully laying their plans, not only to stage a thoroughly successful convention, but to present the eastern bankers with the opportunity to study on the ground, the physical aspects of major developments with which their guests have been intimately familiar—as far as study of engineering reports, appraisals, and bond house analyses and circulars can make them. Now they are to see with their own eyes what has been achieved by the crystallizing of their clients' investment capital into large units for the financing of hydroelectric plants, irrigation works, highways, and public buildings.

To those of us who are interested particularly in the development of the hydroelectric resources of the West, it is gratifying to note that one of the important side-trips is to be over a hydroelectric project typical of the best development of the industry. The first-hand knowledge and keener perspective that will be obtained by these men who play a very real part in making possible these big construction undertakings cannot help but be reflected in a widened interest in the marketing of this class of securities.

RADIO BULLETINS

The Journal of Electricity and Western Industry broadcasts a special industrial and business news report each Monday night at 7:30 o'clock from San Francisco. This report is broadcasted from station KLP, operated by the Colin B. Kennedy Company at Los Altos, California, on a wave length of 360 meters.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

California Water and Power Act Meets Opposition

Few if any of the political issues which various western states have faced during the past half century have aroused the interest and apprehension of the nation as has the proposed California water and power constitutional amendment. It is interesting to note that the measure is receiving almost universal condemnation from chambers of commerce, civic and commercial organizations, public officials and others.

One of the most recent and most powerful California institutions to voice its disapproval of the act is the California Development Association, representing the agricultural and industrial interests of the state. Commenting upon the resolution passed by the board of directors, Charles W. Helser, president of the body, says:

"In undertaking the most careful consideration of so highly a controversial matter as the proposed water and power act, which comes before the electorate of California for its approval or rejection at the forthcoming election, the California Development Association feels most profoundly its responsibility and accountability to the citizenship and the general welfare of the great state of California.

"A policy of timidity and selfish desire to avoid criticisms by highly and politically interested partisans would certainly have dictated that the association refuse to undertake a decision on the merits of the act.

"The contemplated act provides for such sweeping changes in the control and development of water and power service in the state as to unquestionably affect, in a determining way, the future destiny of the state, as basically controlled by these two major elements in its assets of present and future prosperity.

"The association has met the situation squarely. It has passed a resolution setting forth its opposition to this measure. It intends to use the strength of its entire organization to defeat the measure."

Colorado Seeks Relief From Court Ruling

Attacking the priority law set down by the United States Supreme Court in its recent decision in the Laramie River case on the grounds that it "violates principles of equality" between the states, the state of Colorado, the Greeley Poudre Irrigation District, and the Laramie Reservoirs and Irrigation Company have filed a petition for a rehearing of the case. The Laramie decision recently attracted wide attention throughout the West as establishing a precedent to control the distribution of water of interstate streams for irrigation, power and other purposes.

In the suit as it first came before the court, Wyoming contended that waters from an interstate stream cannot rightfully be diverted from one watershed to another which entirely removes them from entering a state formerly enjoying their benefit. It also contended that prior appropriations made at downstream points should not be deprived of waters to which they had established a right and for the use of which they had made considerable investment. Colorado, on the other hand, claimed that it is the right of any state to dispose as it may choose of any or all of the waters flowing in the portion of an interstate stream within her borders, "regardless of the prejudice it may work" to other states below, and, secondly, that states on an interstate stream have a right to the equitable division of the waters and that she had not received her share.

The court upheld Wyoming, at the same time definitely setting up beyond the power of any appeal, the recognition of prior appropriation of water among states which recognize this doctrine.

In the brief asking for a rehearing, Colorado claims that she is entitled to more than one-eighth of the water supply of the river, as the decision implies, because she is furnishing one-half of the water in the stream. The brief also contends that the water should be distributed by "equitable apportionment" and not upon the basis of priority of appropriation.

"Equitable division" is declared to be "entirely feasible" and "in choosing a rule to govern distribution between states," it adds, "it would seem that one should be chosen which will permit the development of every state and not allow one state to be enriched at the expense of another."

What action the Supreme Court will take in the appeal for a rehearing will not be determined until the meeting of that body in October. However, the result of the appeal will be awaited with particular interest as any new decision will vitally affect the development of any western water rights in the future, whether for irrigation or power purposes.

Western Mills Prove Success of Electric Logging

Electric logging as practised by western lumber companies seems to be highly successful, according to reports from the operators at the various mills. The latest application of electrical equipment to the lumbering industry is on the property of the Hutchinson Lumber Company in Butte county, California. Following a complete survey of the logging camps of that organization, General Manager Baker has declared that not only has the electrical equipment simplified the work but that the flexibility of electric power is saving much time in the handling of logs. He points out that in the past when steam was used for moving the logs, there was a considerable loss of time while sufficient power to handle large logs

was being generated. With the electric donkey, the power is always immediately available.

The experience of this California company in using electricity in its logging operations bears out that of lumber operators in the Pacific Northwest, where already there are several electrically equipped mills and camps. That the successful application of electricity to lumbering operations is but another triumph for the electrical engineer is evident from the almost universal praise that is being manifested by the mill owners who have adopted this type of motive power.

Steel Industry For West Seems Assured

Further assurance that the West will soon have its own primary iron and steel industry is contained in the recent announcement of the incorporation of the Pacific Steel Corporation under the laws of Delaware. The headquarters of the company will be located in San Francisco. The new corporation, completely financed by a group of San Francisco, Los Angeles, Seattle and Salt Lake City bankers, will be a combination and enlargement of present steel manufacturing plants on the Pacific Coast.

This is the second merger of steel, iron and coal interests on the Pacific Coast. Utah and California interests, headed by Wigginton E. Creed, president of the Pacific Gas and Electric Company, recently perfected the organization of the Columbia Steel Corporation. Preparations for the manufacture of pig iron in Utah by this company and its shipment to the Pacific Coast for manufacture into steel and for fabrication are now under way. Work on the construction of a railroad to the iron ore and coal fields has started.

The Pacific Steel Corporation is said to include the Pacific Coast Steel Company, which has a large mill in San Francisco, the Southern California Iron and Steel Company of Los Angeles and San Diego, and the Milner Corporation of Utah.

Present plans, according to T. T. C. Gregory, attorney for the company, call for the erection of blast furnaces costing approximately seven and a half million dollars in Utah, where the iron ore and coal deposits are located. The company has been incorporated for $40,000,000.

Pan-Pacific Trade to Benefit by Coming Conference

A conference which promises to have a great deal of bearing on the future commerce of the Pacific will be held in Honolulu October 25 to November 8, when delegates from practically every country bordering the Pacific Ocean gather as the guests of the Pan Pacific Union. At that time plans will be formulated for future inter-racial cooperation in bringing about the development of those interests common to all of the peoples of the Pacific area. The men will represent government departments, commercial bodies and financial organizations.

Realizing that the western ocean is to be the future theater of the world's commerce and that the traditions of peace which have heretofore prevailed in the Pacific can best be maintained by the leaders in all lines of thought and action in the countries bordering its waters, the group proposes to establish among themselves a foundation of mutual confidence on which will be built all future cooperative effort. The keynote of the conference will be sounded in a message from President Harding which will be read by the governor of Hawaii. Secretary of Commerce Hoover, in addition to appointing several delegates from his department, will also send a message. The United States Chamber of Commerce will be represented by a delegation of five members, while every country and most of the principal cities bordering the Pacific will have one or more delegates.

Proposed Act Would Relieve Electric Railways

A plan to resuscitate the electric railways of California by means of an amendment to the constitution of the state by placing the right to grant franchises in the hands of the State Railroad Commission is being sponsored by the California Real Estate Association. The amendment will be voted on at the November election and vigorous steps are being taken to assure its passage. It is hoped that the amendment will make available better transportation facilities.

The association is building its campaign upon the following premises:

1. Transportation is the cornerstone of civilization; it is the handmaid of commerce, the barometer of real estate values and the dominant factor in community development.

2. California communities are facing a transportation crisis. Literally no extensions are being made by electric lines; motor transit is developing haphazardly; the service is below par, and the prospects for rational development for the future are dismal.

3. Transportation developments depend upon the availability of capital for such purposes.

4. The present chaotic franchise system discourages investors and makes it impossible to secure new capital for the improvement and expansion of existing transportation facilities.

5. The only hope of getting a resettlement of present franchises is through the enactment into law of a provision for the granting of modern standardized franchises, and the securing of a unified control of all forms of transportation.

6. The Railroad Commission is the logical seat of control for all matters of transportation. Assisted by a competent body of experts and well equipped engineering departments they already exercise general oversight of our transportation. (a) Their approval is necessary to the granting of a franchise by local authorities. (b) The Commission controls capitalization and financing. (c) And it fixes the rates.

Placing the franchise granting power in the hands of the Railroad Commission will make it possible to secure a unified, impartial and scientific solution of all transportation problems. Inasmuch as the nature of the franchise, and the terms and conditions contained in them, vitally affect both capitalization and rate fixing—matters already in the hands of the Commission—it will simplify the whole problem of transportation development to secure a unified control of all matters affecting the organization of a well-rounded system of transportation which will take care of the present emergency and meet the needs of the future.

Letters to the Editor

Supervision By Power Company of Electrical Features of Pumping Installations

To the Editor:

Sir: This will refer to your inquiry regarding the practice of the San Joaquin Light & Power Corporation with regard to the installation of electric irrigation plants on its lines. This company believes, from years of experience, that it comes within the jurisdiction of the power company to see that the electrical features of a pumping installation are such that the plant will require but little "trouble shooting," thereby adding to the consumer's satisfaction, his economy of operation, and at the same time benefit the dealer who sells the plant as well as the service of the power company.

When the centrifugal pump for irrigation purposes was first introduced there was a tendency on the part of some dealers to sell the pump and motor and leave the installation, especially the electrical features, to chance—often to some wireman unqualified to properly install the job. After the plant was sold and the money collected and after the salesman was gone, the purchasers' troubles were left to the power company, who had to be on the job every month to render service and to collect the bill, and as a consequence had to take the responsibility for the successful operation of the plant. Consequently the power company has adopted certain standards to protect its customers and itself. These standards have been worked out through several years of experience and are practical and inexpensive.

The power company does not require anything fancy in the matter of wiring standards. The job must be put in with wire and switches of proper size and up to the requirements of the standards of the Industrial Accident Commission. If these standards are followed the result will be a job of the proper sort. It is required that overload, time element relays, and low voltage release coils be installed; that the wiring be done in conduit and that the conduit be securely strapped up; that provision be made for the installation of the meter, and that the job be done in a workmanlike manner.

A motor on a farm will not operate successfully unless it is very carefully installed. We have an electrical engineer digging into this matter of service to agricultural consumers, preparatory to making tests and inspections where necessary. We have always fought the consumers' battles and we intend to continue to do so.

The stage of development has been passed where the pump manufacturer sold his pump to the local dealer—usually a gas engine man who bought a motor from some other manufacturer, and then hired a wireman or the power company to install the wiring and connect up the plant to the lines. That scheme of things put too many men on the job. It divided the responsibility and the farmer had to deal with too many concerns.

When a new plant was ready to start, the local dealer, the pump manufacturer's salesman, the motor salesman and the power company's representative were all on the job. The farmer regarded with suspicion all this aggregation of salesmen. He would take a look at them and then at his little plant and wonder just how much actual value in machinery was represented after sales expense was deducted. The farmer paid his money for his plant and everybody "beat it" except the power company man who had to stick to the job and sit up with the infant, hold its head and dress its hot bearings, pack the pump, develop the well, oil the motor, put in fuses and collect the power bill. No one shouldered any responsibility except the power company. When the farmer hooked up to our lines and our meter was set, he became our consumer and it was up to us to look after his troubles.

All this was good experience for the power company, but it was expensive. However, it has resulted in the establishment of certain requirements and electrical standards that are beneficial alike to the pump manufacturer and the dealer, the consumer and the power company. This early experience and several years of subsequent study have developed an absolutely successful scheme of operation.

The pump man has since come to appreciate the necessity of taking the installation seriously and is assuming responsibility to the farmer for the whole job—pump, motor, wiring and installation, and most important of all, the rendering of service after the plant has been installed.

Too much care cannot be given to the actual work of installing the plant. Dealers in some instances have been prone to shave their prices when competition was keen, and take it out of the wiring on installation charges. This could not result in anything but grief. If the price has to be shaved, the last place to think of cutting costs is in the installation. A certain amount of labor and materials are necessary and the job cannot be successful unless these are applied. The manufacturer can build a beautiful pump of high efficiency and high-class workmanship, and he can build on to it a first-class motor, but if he ships it out to some dealer who drops it on a wood foundation and permits the full weight of the suction pipe to hang from the elbow of the pump, and then wires it up in a haphazard manner, he is not guarding his own interests nor the interests of his customer, for the pump will not operate six months. When the dissatisfied purchaser thinks of his troubles the only thing he will see is the name plate on the pump.

A. M. FROST,
Manager Fresno District,
San Joaquin Light & Power Corporation.

Fresno, Sept. 5, 1922.

The Force and Direction of the Wind Controls the Movement of the Straws

To the Editor:

Sir: In a recent issue of your publication the following statement was made, "Any observer of climatic changes within the electrical industry who has been watching the cross currents, eddies and local showers might well forecast a storm brewing. To be exact, all does not appear to be well, particularly in the merchandising and contracting branches of this industry."

This statement appeared under the caption "Straws Show Which Way the Wind Blows," and

while it is conceded that all is not well in the electrical industry, it is gratifying to be able to present information showing a decided turn for the better, and indicating what can be accomplished by a concerted move in the right direction.

The Pacific States Electric Company stands definitely committed to assist the electrical industry in any procedure that will overcome the destructive operations of irresponsible contractors and dealers. Such contractors and dealers who are interested only in doing work cheaply and selling inferior merchandise at a low price.

We have consistently advocated a combination of organizations in the Pacific Coast territory for the purpose of studying the problem and devising a solution that will effectively protect the electrical industry and the electrical consumer from the pernicious activities of this group.

That the wind determines which way straws blow is equally true with the statement that straws show which way the wind blows. We submit that the electrical industry can raise a wind that will clear the Pacific Coast of the straws which are at present irritating the industry and the public alike, and that this has been demonstrated in the results accomplished by "Check" Seal advertising efforts.

An investigation conducted in Southern California last September shows that the irresponsible contractor-dealer group was not only getting the bulk of the residence wiring business, but was rapidly cutting down the potential business of responsible contractors, responsible dealers, electrical manufacturers, jobbers, power companies and in fact every branch of the industry that represents investment and constructive effort.

In a word, these "casual" contractors were deliberately trading upon the electrical consumer's lack of technical knowledge, and sacrificing the interests of the entire electrical industry.

In order to obtain installation contracts, this group was slashing prices, often using sub-standard materials, and what is more important was constantly reducing the number of outlets per job in order to compete on a price basis, at the same time making little or no profit for themselves.

The effect of such methods is obvious, for even if we disregard the constantly increasing dissatisfaction of the electrical consumers resulting from such a practice, we cannot overlook the fact that the growth and very existence of the industry depends upon the outlet for the sale and use of current, wiring devices and appliances, and that any increase in any branch of the electrical business can only be in ratio to the increase in outlets installed.

To indicate the downward tendency of the electrical business under such circumstances, the following figures secured from reliable sources are submitted:

In 1920 the average number of outlets installed by responsible contractors, who constitute about 35% of the total number of contractors in the Los Angeles District, was 14, as against 12.8 by the casual contractors, the general average for the year being 13½ outlets per job.

During the same year the Qualified Group installed 58% of the jobs and 60% of the outlets. However, in the following year, 1921, this condition changed.

In 1921 the Qualified Contractors, whose number still comprised approximately 35% of the total number in the territory, installed but 32% of the jobs and 45% of the outlets. In terms of outlets per job, the Qualified Group had increased the average number per job from 14 in 1920 to 15½ in 1921, while on the other hand, the average number of outlets installed by the Casual Group had fallen off from 12.8 in 1920 to 8½ in 1921, or about 30%, reducing the general average from 13½ in 1920 to 11 in 1921, a decrease of 20%.

For example, let us assume that one thousand new homes are erected in any given territory where such conditions obtain, and that an average of 15½ outlets are required for each home to render adequate electrical service. Applying the conditions of 1921 to these 1000 homes, 270 would have been wired by Qualified Contractors, while 730 would have gone to the Casual Group. Had the Qualified Group wired the entire number of homes it would have represented, in accordance with the average established, 15,500 additional sources of income to the industry, or 15,500 outlets. As a matter of fact, however, there would be installed only 10,755 outlets, the difference of 4,747 outlets being irrevocably lost to the industry. This loss represents thousands of dollars to electrical manufacturers, jobbers, dealers, contractors and power companies.

The following facts indicate what can be accomplished by concentrated effort. A review of the results of the operation of the "Check" Seal program is found by comparing the first five months of 1922, during which the program has been in operation, with the first five months of 1921.

During the first five months of 1921 the Qualified Group installed 32% of the jobs and 45% of the outlets, while in the first five months of 1922 they have installed 48½% of the total number of jobs, and 58% of the outlets.

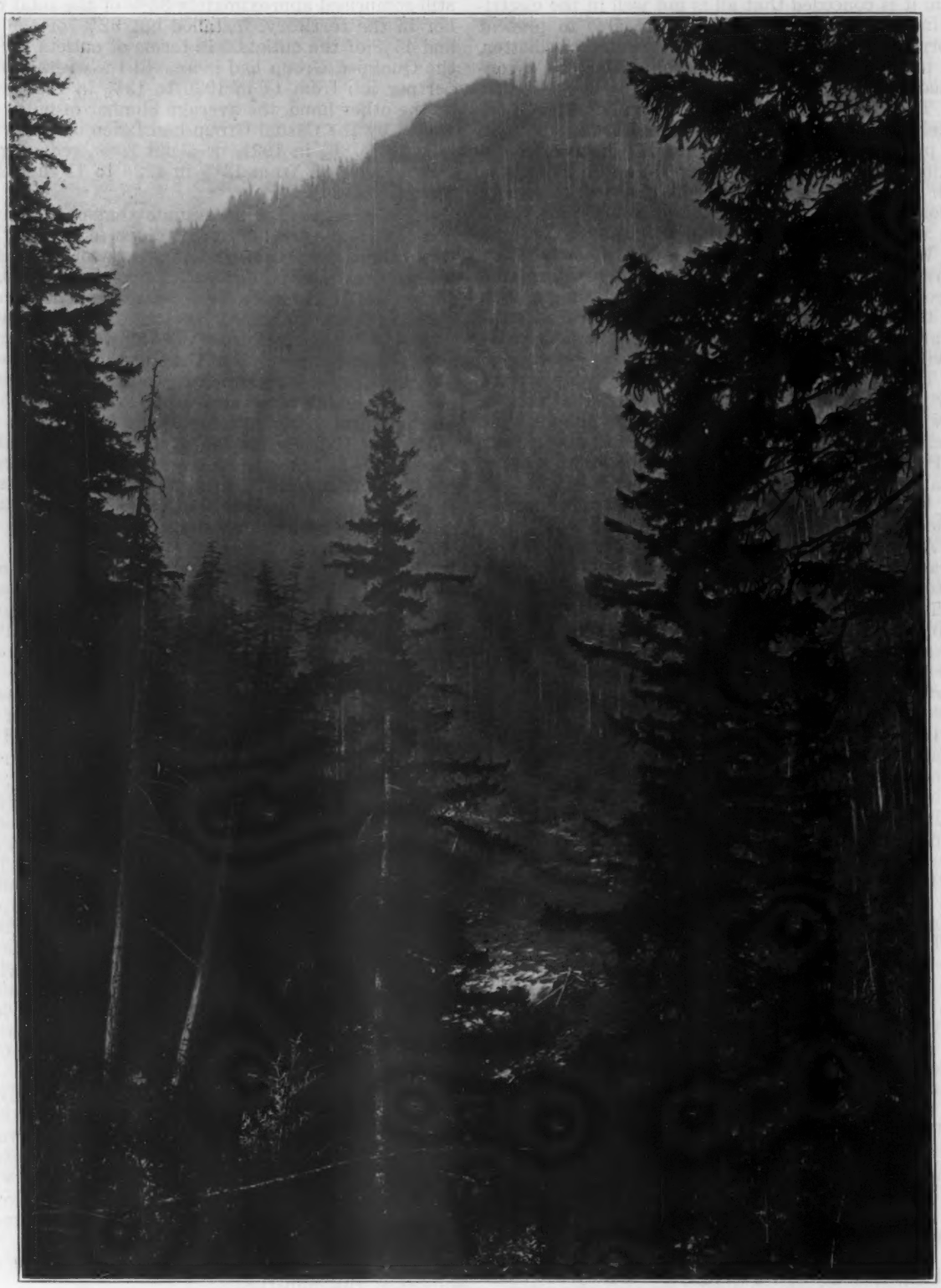
The number of Qualified Contractors in the period of 1922 referred to continued about the same as compared with the total—35%. During the first five months of 1922 there was a total of 50% more jobs let in this territory than during the same period of 1921. Of the new business the Qualified Group of Contractors obtained 78% of the total. This indicates that as time goes on and the total volume of contracting business grows, the Qualified Contractors can hold their own. It also proves that the public is willing to consider good workmanship, standard materials and fair prices against the price cutting, substandard materials and workmanship of the Casual Contractor.

This result is not due to any unusual activity in any one month. It represents a steady, healthful gain on the part of the responsible electrical contracting group. Nor is the effect of this campaign beneficial only to the Qualified Group, for we note with interest that during a like period the Casual Group has been installing an average of three outlets more per job than it did in 1921, indicating that the pressure brought to bear works both ways to the advantage of the industry.

This array of facts is presented to indicate clearly that the force and direction of the wind controls the movements of the straws.

TRACY E. BIBBINS, President.

Pacific States Electric Company
San Francisco, Sept. 4, 1922.



WHEN the ten-million-dollar Oak Grove project of the Portland Railway Light and Power Company is completed the penstock lines for the three 25,000-kw. units will traverse the slope from which this view was taken. The project is located on the Clackamas river, about sixty miles from Portland. Storage facilities will be developed which will permit the utilization during the entire year of three times the present minimum flow of the river. Actual construction work is now under way and this important new project is planned to be put in operation sometime during 1923.

The Spokane Electrical Service League in cooperation with a local contracting firm exhibited this attractive six-room electrical home to the people of Spokane, Washington. Over nineteen thousand persons visited the home.

Spokane's Model Electrical Home

By R. B. McELROY

KEEPING pace with the drive toward the education of the public regarding the manifold advantages of electricity as a household servant, as well as to suggest the installation of convenience outlets, that these advantages may be enjoyed, the Spokane Electric Service League, in cooperation with a local building contractor, recently erected and displayed the latest electrical home to be built in the West.

Careful planning, under the direction of the officers of the League, resulted in an excellent electrical installation. The wiring was done for the building contractor at cost by members of the League. All appliances, fixtures, floor lamps and stand lamps were loaned by the Spokane Electric Service League members, with the stipulation that they could be purchased at cost. These fixtures and appliances were all chosen by lot, after a selection committee had been appointed to secure them. This system of obtaining the necessary devices was found to be very fair and satisfactory to all of the members of the league. A statement to this effect was prominently displayed in the home.

A total of 152 lighting, heating and convenience outlets were installed in the house and each was connected with some piece of electrical equipment. Considerable comment was attracted by the radio receiving set which was connected through outlets in the living room and ball room. Radio concerts that were broadcasted by stations as far away as Seattle were received in the afternoon and evening. The crowds were so enthusiastic over the concerts that it became necessary to place a horn on the outside of the house, as during the "rush hours" only fifteen people were admitted to the house at a time.

The Spokane electrical home is a six-room house with full basement. The living room measures thirty-three and one-half feet by sixteen and one-half feet, with the rest of the rooms of proportionate size. A ball room, den, laundry room, fruit room and furnace room are located in the basement. Hollow tile faced with magnesite stucco is used for the exterior of the house. At night, the white finish sprayed with marble chips gave a very striking appearance when the house was illuminated with flood lights. The furnishings for the home were supplied by the largest household furnishing concern in Spokane and were in excellent taste.

The home was thrown open to the people of that city on July nineteenth and was open daily until August second. During the fifteen-day period 19,405 people went through the house.

All of the branches of the industry were particularly pleased with the results and are reporting a considerable increase in their business. Every new home is having from six to twelve convenience out-

Living room of the attractive bungalow. No ceiling fixtures were used, wall brackets and stand lamps furnished the illumination for the room.

The breakfast nook having an east exposure is a part of the kitchen. Two outlets for appliances were placed within easy reach of anyone seated at the small table.

A silver finished chandelier and wall brackets supplied means for illuminating this dining room. Ample provisions for appliance outlets were made.

Daintiness is expressed throughout this bed room, which was illuminated by a center ceiling fixture. Two bracket outlets were located near the dressing table.

lets installed and many people have inquired as to the possibilities of bringing the wiring of their homes up to date.

The official dedication of the home was held at two o'clock on the opening day and at that time George A. Phillips, chairman of the publicity bureau of the Chamber of Commerce, addressed four hundred people who were assembled at the house. Mr. Phillips' talk dealt with the advantages to be derived from such an educational display. Mrs. S. E. Hege, president of the Women's Clubs of the city, officially unlocked the door and invited the people of

A coal burning steam furnace is here seen connected with an electrical furnace tender. This appliance permits the owner to maintain any desired temperature. The coils for the refrigerating plant are seen at the right of the picture.

the city to visit the home. Thus the electrical home was tied up with the entire community and the good will of the people of Spokane was secured from the start. In addition, moving pictures were taken of the opening ceremony and were displayed at the leading moving picture house.

A definite route for passing through the house was laid out so that the visitors would be able to see every room. As the interested people entered the living room, they were presented with a ticket that entitled them to a chance on the miniature model of the electrical home. This model had previously been displayed in several of the display windows of the city. The contest caused considerable comment and permitted those in charge to keep an accurate check upon the number of visitors. Upon leaving the home the stub was deposited and the visitor was presented a sixteen-page illustrated folder which contained suggestions on house wiring and illumination. This folder was well filled with plans and descriptions of modern installation. Uses of convenience outlets were particularly stressed.

During the fifteen days that the house was open to the public a demonstrator was present in each room of the house. This man called attention to the electrical features of the room and gave suggestions as to the proper location of outlets in rooms that the visitors cared to ask about.

Prior to the scheduled opening of the electrical home, small printed invitations were sent out with the monthly bills of the power companies of the city. Thus everyone who was a user of electrical energy was given notice of the display.

The invitations read as follows:

Your Electrical Servant
invites you to visit

SPOKANE'S MODEL ELECTRICAL HOME
Corner Fourteenth and Bernard

July 19 to August 2, inclusive. Open 10 a.m. to 10 p.m. daily.
Official dedication 2 p.m., July 19.

SPOKANE ELECTRICAL SERVICE LEAGUE.

This was brightened up by a cartoon of a man in a dress suit radiating electrical energy.

The home was in charge of a general committee which handled all matters pertaining to it. This committee appointed a publicity man, who secured the required recognition from the local newspapers, a finance chairman and an appliance selection committee already mentioned. This general committee was composed of R. B. McElroy of the Washington Water Power Company, who acted as chairman, Warren Oliver, E. W. Murray, R. C. Steeple, all electrical contractors, and F. P. Carson of the Western Electric Company.

An iron, a washing machine, a plate for heating the clothes boiler, a mangle, all electrical, and two wash tubs make up the equipment for this electrical laundry room. The hot water tank, which is heated electrically, is also situated in the laundry.

The house was built by A. J. Chitty & Company, local building contractors. The home is now on the market at $15,000, complete with all furnishings, and several people are figuring on purchasing, but the contractors are reported to be not particularly anxious to sell as one of them had originally planned to occupy the home himself.

Spokane's electrical home was run upon a particularly economical basis. The cost of advertising was approximately five cents per person, and considering the total attendance, which was in the neighborhood of twenty thousand people, this is an extremely low advertising charge. Since business has been increasing rapidly since the display in the electrical home the members of the League are highly pleased with the results.

Remotely Controlled Generating Stations

By A. T. PARSONS

IN THE economy of the nation, water power is the most desirable form of power, since it does not use up any of our natural resources, as steam power does, for no matter how much we take out of our rivers and streams, next year and the years after they flow just the same. But there are only a few very great water powers like Niagara Falls and the power of the Mississippi at the Keokuk dam, for most of the hydraulic powers are smaller. Furthermore, while most of the big powers have been developed, there are many small powers still undeveloped. However, there is a limit in size, below which it is not economical to develop power by the previous methods, due to the cost of operation; but with the increasing development of electrical engineering, this lower limit has rather increased. While a small station, which cannot afford high-class engineers for its control and operation, may have been fairly successful when it was an isolated station, and any trouble therefore only local, now, when tied into the huge electric-distribution systems which cover the country, a much higher safety factor of operation is necessary for the small station, since any serious trouble may involve the entire system. But the safety and reliability of a station is no greater than the character of the minds which direct and control its operation. Therefore, aside from the economy resulting from the saving of the cost of attendance, reliability of operation makes it preferable to control and operate such small stations at a distance, from a large station which can afford the quality of attendance giving the assurance of first-class operation. And finally, with the present-day development of electrical engineering, it is possible to make the operation of the small station entirely automatic and thereby take its control entirely out of the hands of the rather indifferent class of attendants economically available for such stations, and give it the safety and reliability corresponding to the skill of the high-class engineers who control its operation; that is, the designing engineers who have devised and built its automatic control. Thus the automatic hydro-electric station is not merely an advance in economy, which makes the operation of small stations possible, stations which were previously below the economical limit, but it is an equal advance in the safety and reliability of the operation of these stations, and of the systems with which these stations are connected.

CHARLES P. STEINMETZ.

THE problem of the utilization of the streams in southern California for irrigation has been almost completely solved, and except in flood-stages there are few drops of water that reach the ocean without doing their part to help along the cause of agriculture. Utilization of the power resources is not so complete, although many important installations have been made. This is largely because in only a few instances have local conditions been favorable to development of any considerable amount of power at one point. In fact, for several years past the tendency has been to develop in large stations at distant points, the power required by the growth of population and industry, rather than to incur the high unit costs for attendance inevitable in the ordinary station of only a few hundred horsepower capacity.

On the other hand, the Ontario Power Company, supplying several towns and the surrounding agricultural district in the vicinity of Ontario, has recently constructed two plants of small capacity, plants which would be unprofitable if it had been necessary to pay the wages of even one attendant per shift at each station.

These plants are in San Antonio Canyon, about 40 miles east of Los Angeles. The drainage area of the stream above the point where it leaves the canyon and forms a fan-shaped gravel wash on the plain below, is about 27 square miles. The elevation of the watershed ranges from 2,000 ft. at the mouth of the canyon to 10,080 ft. at the summit of San Antonio Peak. The average annual precipitation at the mouth of the canyon is 15 in. but is considerably higher over most of the watershed. Along the lower seven miles of the canyon, which is where all the present power development is situated, there is relatively little side-drainage, the principal runoff coming from the upper part of the watershed. The average flow for five months during the late winter and early spring is 20 sec.-ft. This is exceeded only during flood periods. The flow gradually decreases, the minimum being about 8 sec.-ft. At the mouth of the canyon the small amount of water that is not diverted for irrigation sinks into the gravel wash, some of it reappearing several miles farther south, and finally flowing into the Santa Ana River.

To the engineer, an unusual historic interest attaches to San Antonio creek, because it was the scene of one of the earliest hydroelectric developments, probably the earliest where power was transmitted at higher than the generating voltage. Early in 1892 the San Antonio Light and Power Company installed two impulse turbines operating under 400-ft. head and each direct connected to a 120-kw. generator. Power was transmitted at 10,000 volts to Pomona, distant 15 miles.

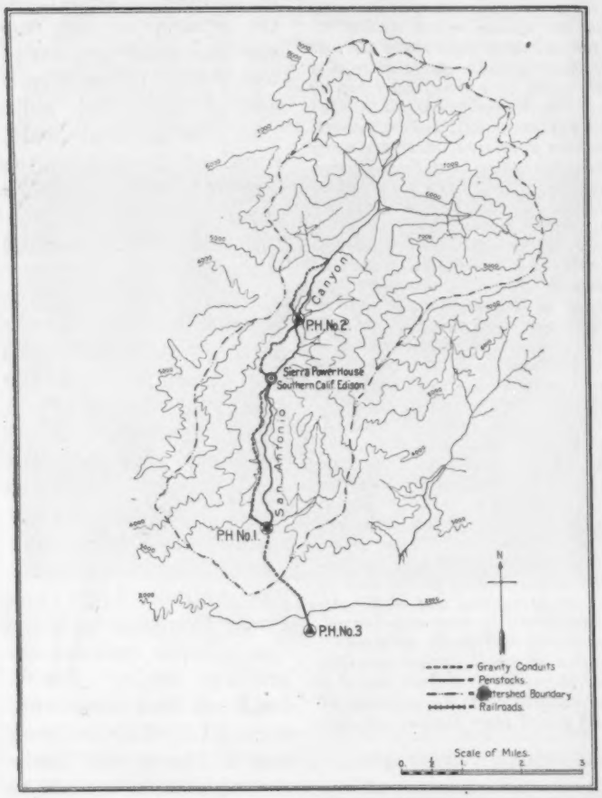
The present development of power in the canyon is at four points. One of these, the Sierra plant of the Southern California Edison Company, was constructed in 1900, when the conduit for the old San Antonio plant was extended half a mile downstream, adding about 200 ft. to the available head. The old plant was then abandoned. The other three plants comprise the entire generating system of the Ontario Power Company.

Power House No. 1 of the Ontario company was constructed in 1902 at a point about one mile above the mouth of the canyon and just above the intake of the irrigating conduit of the San Antonio Water Company. The power intake is about 2½ miles farther upstream from which point a concrete gravity line extends to a small forebay.

The penstock is composed of 2,000 ft. of riveted steel pipe, 24 and 22 in. in diameter. The static head is about 700 ft. There are three impulse turbines each direct connected to a 250-kw. generator. At the higher water stages there is sufficient water for all three units at full load. At lower stages only two units are operated.

With the construction of the two plants above described, the possibilities for the economic development of the power resources of the stream appeared

for the time being to have been exhausted. In fact, several years elapsed before another plant was built. In the meantime, the demand for power in the territory served by the Ontario Power Company increased, the cost of fuel oil for steam plants more than doubled, and perhaps most important of all, the



The San Antonio watershed, showing the three plants of the Ontario Power Company. The operator at Plant No. 1 controls the generating equipment at Plant No. 2. Power house No. 3 is entirely automatic in its operation. All of the water used for generating power is subsequently utilized in the valley below for irrigation.

remote control or semi-automatic type of station was developed.

In 1919, Plant No. 2 of the Ontario Power Company was constructed. The point of diversion is about four miles upstream from Plant No. 1. From here, 3,280 ft. of 30-in. cement pipe extends to the forebay, which is a reinforced concrete tank 10 x 12 x 12 ft. The penstock is composed of 1,413 ft. of 24-in. riveted steel pipe. The power house is situated a short distance above the point of diversion for the Sierra plant of the Southern California Edison Company, already described. The static head is about 310 ft., and the net effective head at full load, 290 ft.

The station contains a single overhung double-nozzle impulse turbine with a capacity at full load of 550 hp., direct connected to a 500-kva. generator with direct connected exciter. Besides the two power nozzles, a third nozzle is provided to act as a bypass when the plant is shut down, since no storage is available. All three nozzles are operated by electric motors provided with limit switches, interlocking in order to maintain fixed relative action between the three, and thus obtain the maximum possible efficiency at all stages of load and water consumption.

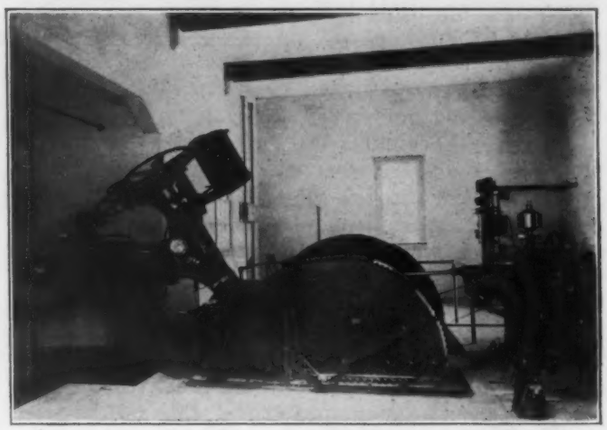
Jet deflectors actuated by the governor divert any desired part of the jet from striking the wheel, thus providing speed regulation under minor variations of load.

The operator at Plant No. 1 controls Plant No. 2 by means of a double-throw switch. When the plant is operating on full load, both power nozzles are full open, and the bypass nozzle is closed. If it is desired to reject all of the load, the operator throws the switch to the closed position. A series of relays actuates the nozzles, closing the upper one first, and at the same time gradually opening the bypass nozzle. Limit switches are used to prevent any jamming of the mechanism. In starting the plant, the operations are reversed.

Any load condition between full on and full off may be reached and held by manipulating the switch at Plant No. 1. Synchronizing is accomplished through the remote control of the power nozzles, the synchronoscope and main generator switch being on the panel with the nozzle control switch in Plant No. 1.

Except during flood periods, all the flow of the stream passes through the penstock. The water consumption of the unit is governed by the water level in the forebay, which is read from a long distance indicator by the attendant at Plant No. 1.

During the three years that this plant has been in operation, no time has been lost because of shutdowns. The results in general have been so satisfactory that the company has just placed in service



Interior of the remotely controlled 500-kva. hydroelectric generating station of the Ontario Power Company, showing the motor operated nozzles and the automatic governor.

a completely automatic plant, known as No. 3, near the mouth of the canyon.

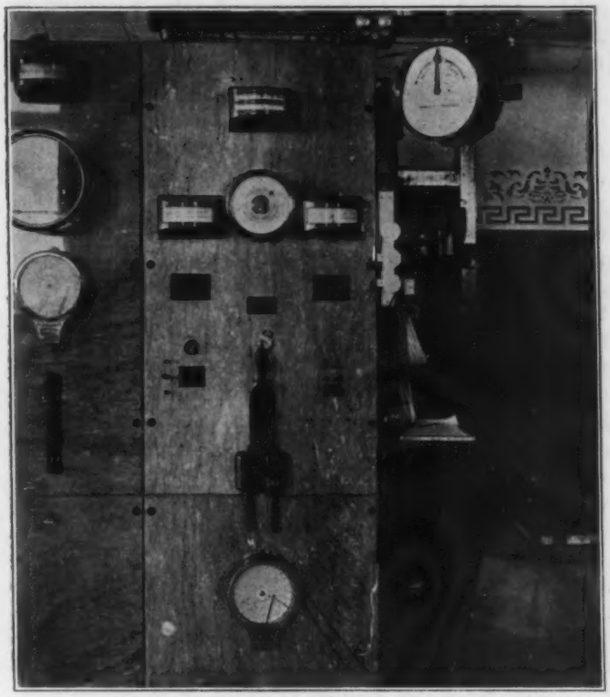
The water supply for the plant comes from the irrigating conduit of the San Antonio Water Company. The point of diversion is just below the Ontario Company's Plant No. 1. About one-half mile below the intake, the conduit is joined by a tunnel driven by the water company in the gravel bed of the stream, which diverts most of the underflow. From this point the conduit follows the eastern side of the

canyon to a point about 1½ miles below the intake. Here the grade line of the conduit is so far above the cultivated land of the plain below that power development is possible without interfering with the rights of irrigators.

A penstock 2,959 ft. long makes available a gross head of 284 ft. The pipe is of riveted steel, the upper half being 22 in. and the lower half 20 in. in diameter. The effective head is 250 ft. at full load. The plant itself is almost an exact duplicate of Plant No. 2, except that, as already noted, it is entirely automatic, the generator going on the line and being synchronized without requiring attention from the operator at station No. 1.

The equipment consists of a 500-hp. single overhung double-nozzle impulse turbine direct connected to a 400-kva. generator with a 12-kw. direct connected exciter. The mechanism for opening and closing the power nozzles is similar to that at Plant No. 2, except that no bypass nozzle is provided, any water not required for the operation of the plant being handled by the jet deflectors.

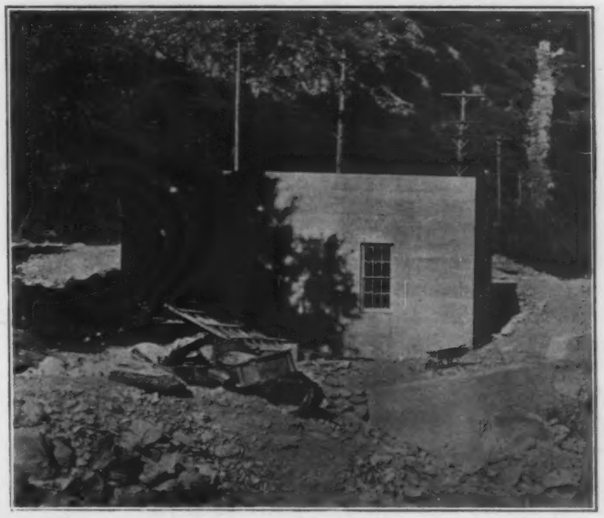
At both Plants No. 2 and No. 3 an elaborate system of protective devices has been provided to prevent overload, overspeed and hot bearings. In the



The switchboard in the main plant of the Ontario Power Company from which the operator controls a 500-kva. generating station 3.5 miles distant.

case of hot bearings, a thermostatic relay opens a master control circuit which closes down the plant until an inspection is made and the relay again set. Thermal relays are used to disconnect the generator from the line in case of overload. An emergency tripping device on the governor protects against overspeed. To start the plant after a shut-down due to any of these causes, the relays must be set manually, necessitating a visit to the plant. This is desirable in order to determine the exact nature of the trouble and correct it. Occasional visits are required to each plant for inspection, oiling and adjustment of the equipment.

Through the construction of Plants No. 2 and No. 3, the output of hydroelectric energy of the



Remotely controlled generating station of the Ontario Power Company in San Antonio Canyon. This plant is operated from a switchboard at a larger plant 3.5 miles down the canyon. Occasionally a patrolman visits it to oil the equipment and make minor adjustments.

Ontario Power Company has been virtually doubled and several millions of kilowatt-hours per year furnished to consumers that would otherwise have had to be steam generated. Had it been necessary to place operators at each station, the attendance charges would have been prohibitive. The entire development in San Antonio Canyon by private enterprise is notable, not only as illustrating the efficient utilization of both water and power resources as a result of cooperation between the various interests involved, but also because of the foresight and sound judgment displayed by the management of the power company.

What a Dime Will Do

Some one with a penchant for statistics has figured that a dime's worth of electricity, based on a price of 10 cents per kw-hr., will perform the following services in the household:

Operate a 16-c.p. lamp for about an hour. Operate a six-lb. flat iron for 1½ months. Do a washing equivalent to 20 sheets each week for about 2½ months. Operate a vacuum cleaner long enough to clean about 1/10 of an acre of carpet. Operate a sewing machine for 20 consecutive hr. Drive an electric fan four hr. a day for nearly a week. Brew 2½ gal. of coffee in an electric percolator. Operate a heating pad for from ½ to 1 week depending upon the heat used. Operate a foot warmer five consecutive hr. Operate a water pump long enough to raise 100 gal. 1,100 ft. Make 100 slices of toast.

Relation of the Chain Store to Manufacturer and Retailer

The Fourth of a Series of Articles Devoted to an Analysis of the Modern Tendencies in the Marketing of Products and the Advantages of Different Types of Distribution Methods as Applied to Various Classes of Goods

By E. A. KINCAID

IF a manufacturer finds it to his interest to sell "over" the jobber directly to the dealer he will have to decide between one or more of several types of retailers. Of these the general store is one of the oldest and most interesting. It developed from the old trading post of frontier days when each post had its general store to which settlers came with their furs, skins, livestock and produce to be exchanged for provisions. To meet the demand of the time such stores carried a great variety of goods and it was not uncommon to find hardware, drugs, implements, groceries, harness and saddles and dry-goods in a single establishment.

Some of these stores still exist and where they do, they function well, for they often act as bankers for hard-pressed settlers who do not have bank credit to draw upon. But for the most part the general store has passed into oblivion along with those heroic pioneers who patronized it.

Transition of the Trading Post

The old trading post expanded into a village and then by easy and rapid stages into town and city. With the growth of population, towns became able to support rival stores and some of these lopped off the less profitable lines one by one until they became establishments with but a single line. Thus the general store was the forerunner, if not the progenitor, of the specialty store. While it may be said that the specialty store as a type is older than the general store, here in the West the order was generally reversed. But quite regardless of the order of appearance, the tendency toward the specialty store has not subsided. On the other hand the appearance of improved methods of production and distribution, together with the appearance of new products, has stimulated the movement toward specialty stores and the end is not yet in sight.

Departmental merchandising appears to have originated in specialty dry goods stores. While it is not certain as to whom credit is due for the development of the departmental idea, it is generally agreed that conditions following the Civil War greatly encouraged its application. After the conclusion of that struggle there came a period of economic readjustment and declining prices. This situation was also accentuated by the growth of the railroad net and the improved physical distribution of the expanding output of factories no longer needed in the conduct of war. Declining prices generally mean a reduced volume of sales which can only be solved by offering goods at prices in harmony with the level of purchasing power. One way to meet the decline in demand is to buy at lower levels. The merchants of the post-bellum period approached the problem from this angle and they saw but one possibility, that of buying from the manufacturer at the jobber's discount. To obtain such concessions from the manufacturer it was necessary for the merchant to demonstrate his ability to buy in wholesale quantities, but this in turn depended upon the introduction of retail merchandising methods which would give the required turnover of stock. To gain this end certain merchants reorganized their buying methods, reduced their prices, contented themselves with small margins, largely the result of lower net profits, which they multiplied by an increased number of turnovers of stock organized by lines, merchandised by lines and made to stand or fall on their record by lines. Thus it came about that economic pressure broke down the traditional movement of goods from manufacturer to jobber to retailer, and it may be said that the department store is in part the result of the adoption of merchandising methods which would give that volume of sales essential to induce a reluctant manufacturer to break with tradition.

Post-war Conditions Influence Distribution

The same forces produced the chain store. Low selling prices in a period of high living costs while deflation was in process following the Civil War resulted in the organization of some of the earliest chains. But the high prices which began their long upward climb about 1896 had more influence than any other one factor. Thus it has come about that the price level in the period from 1896 to the conclusion of the recent war was the one during which the chains made most of their progress. Like the department store, the chain made a place for itself because of an advantageous combination of the fundamentals of merchandising. Lower prices, narrower margins, smaller profit and increased turnover was the happy combination which spelled success for the chain store. It may be said that the chain store is the result of the carrying over of the department store idea into a larger expressiveness and a greater scope. Instead of many small stores under one roof, the chain has many separate units under one management. The overhead is distributed among the units and each one stands or falls on its record as a profit-maker.

How Chain Stores Started

The entering wedge of chain store distribution was the result of (a) the fact that some merchant, who succeeded in the conduct of a specialty store, bought another in his own community, then another in a near-by town and so on until he had a small chain; (b) Other chains were formed by the simultaneous purchase of a number of stores by a corporation organized for the purpose. Regardless of the form of origin, the outstanding result was the

fact that the chain had buying power. How long could the weight of a traditional distributive system hold out against a new type of retail distribution which possessed the very economic attribute which was so essential to success in the field of production? If large-scale production meant a low cost per unit of output, why would not the same principle hold for distribution? And, if two organizations operated on this principle, what could keep them from co-operation? Nothing except sheer economic blindness, for the very forces of economics would bring them together. Thus it follows that economic law is breaking down the barriers to its free play even in this day of restricted competition.

Of the three types of retail institutions here so briefly referred to, the chain store is the most unique and the most interesting. Its phenomenal growth and its merchandising possibilities, its potentialities, so far not fully grasped, have made it the most outstanding feature of the modern retail distributive situation. A good deal has been said for and against the chain but the facts have not always been fairly presented. The enemies of the chain have viewed it as a menace and its friends have overstated its advantages. The actual facts do not warrant extreme statements in either respect, for the facts are only in the process of development and just what the chain store actually is must rest with the future.

Extent of the Chain Store System

There are at present about 75 responsible chains operating in the grocery field and these include about 40,000 stores. In no field is there a greater number of chains and yet they make but a slight dent in the grand total of 350,000 retail grocery stores which the country now has. The seventy-five chains do not make a more favorable comparison with the 4,000 wholesale grocers. It may be said, therefore, that the chain is in its infancy and that we must concern ourselves chiefly with possibilities which this type of organization embodies. What the chain store has so far accomplished is the result of the efficient utilization of merchandising possibilities of high class goods, efficient service, quick turnover and the cash and carry system.

A mere enumeration of these items is not sufficient as the success of the chain up to this time is the result of the successful combination of the uttermost possibilities of these fundamentals. It is necessary to understand that the chain has so harmonized these essentials in practice that it has been able to combine the functions of the jobber and the retailer. Thus it has eliminated a good deal of overhead expense. Here is an important matter. Overhead is a burden on the flow of goods. The more hands that the goods must pass through, the greater the burden.

Principles of Success of Chain Stores

The chain attacks this burden in two ways.

(a) It reduces the aggregate of overhead by curtailing the mechanism of distribution and consolidating the functions of jobber and retailer in one hand.

(b) It reduces the burden of overhead per dollar of sales by speeding up the turnover. The first result is accomplished (1) by the elimination of traveling and specialty salesmen, those necessary functionaries where distribution includes the jobber; (2) purchases in larger quantities than the wholesaler can use; (3) purchases concentrated in the head office of the chain, and (4) delivery directly from the manufacturer to the chain warehouses, contribute to this result.

(c) The second result is obtained by turning stock rapidly, varying from twelve to twenty-five times in the grocery trade, by selling for cash, by making no deliveries, by low margins of net profit, usually less than three per cent on sales in the grocery trade, by sales of fresh goods, by cleaner and more attractive stores, and by goods plainly priced with one price for all.

While each of these points must be given due and separate consideration in order to grasp the strength of the chain, the actual power of the chain type of organization may be summarized in its great buying power and low margin of profit. What chance has the individual retailer to hold out against a type of merchandising that operates on a gross margin of from 13½ per cent to 18½ per cent when such a merchant maintains that he must have a gross margin of thirty per cent?

Clearly the individual retailer must give ground to the chain store, but it cannot be said that he must disappear. In the first place, the essentials of success in retail merchandising are almost as fully available for the individual merchant as they are for the chain store. No wide awake retail merchant need fear the chain store. He can have a clean and attractive place of business, courteous employes, good values at reasonable prices, more frequent turnover and its correlary advantage of fresh stock and fewer calls from the jobber's salesmen, who are so often order-takers rather than salesmen. A merchant successful in both service and chain store operation asserted that with knowledge gained from the latter he could open a service store at any time and hold his own alongside the very best chain store. This assertion is not exaggeration, but it must be borne in mind that the fundamentals of success in merchandising have been worked out by experts in the staff of the chain and passed down by them to managers of the units.

Retailer Should Profit by Example

Thus we arrive at the next point, for it must be recognized that some one must do the same sort of thing for the service store if it is to maintain its position in the present scheme of distribution. What organization will do this? There seems to be a recognition of the necessity of an awakening on the part of service store merchants and their wholesale friends. If this awakening comes about much can be done to retard the growth of the chain store. If it does not materialize in an effective way the invasion of the chain will proceed apace, for it is simply the result of utilizing the latent possibilities in the present system of distribution. But even if the service stores continue to function in the same old way it is not conceivable that they will be utterly routed, for several reasons. (a) Many people are not able to pay as they go and they must patronize a retail establishment that will extend credit. (b) Others will not personally attend to the buying of goods and these will generally prefer to use the telephone.

(c) Still others will require a delivery service and other sorts of service which are thought to be in keeping with their social standing. In general the service store will continue to function, even if in a limited way, for the sake of two classes of people—the poor and improvident and the wealthy. The service store lives because of the misfortunes, the lack of thrift and the social ideas of a considerable number of persons who will not soon disappear from our society.

As for the others, the chain store is an expression of that efficiency which actuates the household affairs of a large number of buyers. It is an incentive to the very thrift which it gratifies and because of this the chain store is a distinct economic gain for society in general. That this is true is demonstrated by certain outgrowths of the expansion of chain store distribution. Prominent among these outgrowths is the buying exchange. The quantity discounts extended to the proprietors of chains have placed the individual retailer at a serious disadvantage and he has not been slow to recognize that his chance of survival would be much greater if he could get into a position to share in the quantity discount. One way to accomplish this result is to form a buying exchange. By such a method a group of retailers is able to buy in quantities and to demand the discount that properly accompanies such buying. The individual merchant operating alone cannot buy in quantities without endangering his very existence, but when he cooperates with other merchants the danger of overstocking is removed and the advantage of the larger discount remains. Hence the buying exchange.

Growth of the Buying Exchange

The buying exchange is not a very welcome addition to the mechanism of distribution, but how can the manufacturer refuse to extend it the quantity discount when he extends it to chains? He cannot consistently do so. If he did he would be bolstering up jobbers who are greatly in need of economic pressure to bring about greater efficiency on their part. If the buying exchange can do its own jobbing more economically than the jobber can do it, is the manufacturer to say that he will foster one form of organization that buys in quantities and not the other? To do so would be to subvert the very economic principles which should guide the manufacturer. He is seeking efficient channels to market. He cannot refuse one and accept another merely because of some difference in the form of organization. To do so would amount to a distinction on the basis of sentiment. The manufacturer has no recourse save the abandonment of the quantity discount in toto.

Influence of Chain on Manufacturers

It goes without saying that the coming of the jobbers. By cooperation between wholesalers and chain has greatly stimulated the use of quantity discounts by manufacturers. The use of this method of selling, places the manufacturer in line for business from every source without discrimination and without the recognition of other than purely economic forces as the basis for business. Under the quantity discount all buyers face the manufacturer on the same basis—their buying power. The quantity discount therefore places the onus which it necessarily involves squarely where it belongs. It leaves the dealer the necessity of getting on that basis of operation which will bring results. It carries over the economics of manufacturing into the merchandising world. Thus one economic law is made to govern throughout rather than one economic principle governing in the field of production and another in the field of distribution. It places the issue squarely up to the manufacturing jobber, and it is said that ninety per cent of all jobbers are manufacturers to some extent. He can go on competing with the manufacturer, but he will not be favored with an inviolable jobber's discount which protects him as a jobber and leaves him to compete as a manufacturer. Thus the quantity discount comes right down to economic brass tacks. It hurts, but it must be healthful for all of that.

Application to the Electrical Industry

What is there in all of this for readers of the Journal of Electricity and Western Industry, particularly for those readers who are interested primarily in the distribution of electrical supplies of all sorts? Just this: that the great movements now going on in one field of destribution must eventually find their way into others. The business world is to some extent set off into compartments; but economic law is the enemy of all that rests on more tradition and it will eventually batter down the bulkheads that do not rest on a sound economic basis. While the discussion has rested upon material drawn from the grocery trade, the facts are none the less applicable to other lines. There are not fewer than 166 chains of department stores, general stores, five- and ten-cent stores, furniture, music, gas and electric appliance stores with close to five thousand units. Many of these stores handle electrical appliances and the 204 drug chains with more than 2,000 units are not wholly without electrical goods. While there are more than 16,000 electrical retail establishments, large quantities of electrical goods find their way to market through automobile supply shops, of which there are more than 46,000; through garages, of which there are more than 36,000; through hardware stores, of which there are more than 37,000, through drug stores, of which there are more than 35,000, and, finally, through department stores, of which there are above 2,000.

There are more than one million retail establishments of one kind and another in the United States. If the chain store merchandising principles are sound they will prosper and there is room for great expansion among these one million retail stores. Who can tell how far the movement will go? Only the independent retailers and their friends, the jobbers the old scheme of distribution may be made to function with new effectiveness, but if it does it will have to adopt some of the merchandising principles which have made the chain store what it is.

Sources From Which Labor May Be Recruited

By George H. De Kay

THE craftiness of a good lawyer, we are often told, depends not so much on his knowledge of the law as his knowledge of where to find it when he needs it—likewise with fishing and employing men.

It is all very well to be up to the minute on methods of selecting men, testing them and putting them through various forms of analyzation, but without the men to try this on, the knowledge is of small value.

An old negro once contrasted hunting and fishing by saying that in hunting you walk till your feet won't do their duty and you "gits nuthin'." But in fishing you know the fish are found in water and where the water is, so you "gits fish—mebbe."

Promiscuous or Systematic Searches

In the same manner there are two methods of locating men when needed. One is to go after them in a promiscuous manner with uncertain results, the other to look for them where they will most naturally be found. This can be done through a variety of mediums.

Large organizations such as railroads, oil companies and well known and established department stores have men constantly applying directly to them for employment. From this source they are able in many instances to fill vacancies with the men who have made application and who are skilled in the work to be done. Very often these men have worked for the company in other sections of the country and carry with them credentials showing their fitness for certain tasks. Likewise, department stores are constantly besieged with applicants who either can, or think they can, sell behind the counter or perform other duties.

In all organizations where inquiries are made daily regarding employment, adequate facilities should be provided to handle those applying. Even if a man's services are not needed he deserves courteous attention; if there is a possibility of his being used in the near future he should be given the privilege of filing an application—otherwise he should be frankly told that there is no opening for him. Places that make a practice of allowing a man to file an application simply to get rid of him will sooner or later find that when they really need help they will have difficulty in attracting the better class. There is more or less of a free masonry among the unemployed and opinions are quickly passed along regarding good or bad treatment encountered.

Nature of Help Determines Sources

The sources from which help may be secured vary according to the nature of the help needed. To hire laborers ready to leave at a moment's notice for any place, one has but to go into certain sections of any city where this class congregates. This is generally where the labor employment agencies are located. Sacramento has its First Street, San Francisco its Howard Street, others cities in the same manner. In these districts the employer can be sure of finding men ready and able to do anything from digging post holes to committing murder, as the police court records show. It is an interesting sight to see an employer call for from six to a dozen men, see them scatter to nearby "fleabite" hotels and reappear with a roll or bag containing their earthly possessions, ready to travel.

When men were hardest to find during the war period, many employment managers in large plants found it necessary to drag the lowest dens and hangouts in the city slums and, with police assistance, round up the shirkers found there and enforce the "work or fight rule." Frequently both parts of the rule were acted out on the spot, the shirker putting up the fight and the police doing the work.

But these methods will not secure the skilled worker, or what is commonly known as the "white collar class."

The Newspaper an Aid to the Employer

When a newspaper is used to secure men, it is best to advertise in the Sunday editions as more men will then be reached. The advertisement should state fully and clearly the work to be done, age and other requirements. Advertisements stating the salary to be paid receive better response than those without this information. Men look with suspicion on any advertisement stating that the salary will be large or that the earnings will be in excess of anything they have ever received, for bitter experience has shown that such are generally "commission" jobs where the advertiser stands to do all the gaining and the employe gets the experience.

Another method of securing highly trained men is through technical or trade publications in their special field. Likewise in such magazines will often be found advertisements from men seeking a change or broader opportunity.

Reliable Employment Agencies Valuable

In every city are employment agencies, both public and private, which specialize in bringing employer and employe together. These agencies are operated either as state employment agencies giving a free service to all, as charitable organizations under city or religious supervision, as fraternal organizations, trade unions and private firms. The latter class depend upon fees charged the man for whom they secure a position, these fees running from a small sum to charges which seem entirely disproportionate to the value of the work secured. In some states such fee-charging agencies are regulated by state laws and are under the supervision of the State Labor Commission. They are required to pay a yearly license fee ranging from one hundred dollars in cities of the first class to as low as ten dollars in the smaller cities. In addition they must keep certain records showing the names and addresses of

those to whom employment service is given, fees charged, and the like. Reports covering these are made at stated intervals to the State Labor Commissioner who has power to enforce the laws governing the agencies. In some states the fees that such agencies are allowed to charge an applicant, when he has secured a position, are fixed by statute. Because of the necessity for charging fees, in order to maintain their business, these agencies are more and more coming to be looked upon with disfavor by employers, although in most cases they maintain a high ethical standard and endeavor to serve both employer and employe in a satisfactory and efficient manner.

Business colleges offer a fruitful field for securing young men and women who have been trained along clerical lines. Generally these graduates are without much commercial experience and are willing to start at a comparatively low salary until they can make good.

Veteran's Rehabilitation Bureau

The government is inaugurating a system for disabled veterans who have received rehabilitation training but who have not been able to secure experience in their new work. Such men are being placed in offices for a period of three months, during which time their salaries are paid by the government. These men are subject to the same rules of the company employing them as other employes and are on the same footing. If a man is discharged by the company, for sufficient cause, his training pay is stopped and he is then left to his own devices. By cooperating with the Veteran's Rehabilitation Bureau employers will be able, not only to aid deserving ex-service men, but also to cut down their own expenses for a time.

Most colleges maintain more or less elaborate placement offices through which employers may reach those either about to graduate or men finding it necessary to work while securing their education. Likewise public school officials are willing to cooperate with business men, especially nearing vacation or holiday periods when a large amount of extra unskilled help is needed.

Trade unions have offices through which men are cleared and from them, men skilled in trades may be located. Sometimes highly specialized men can be secured through such offices when they cannot otherwise be readily found.

Another source of securing help is through employes who can recommend men from their circle of acquaintances. In the past some companies have even paid a bonus for new employes brought in, but this feature has its drawbacks as it tends to bring in a floating class or to draw men from other nearby companies as well as unsettling conditions generally.

Religious, fraternal and charitable organizations frequently maintain more or less permanent forms of employment bureaus, but the chief fault found with them is that sufficient care is not taken in fulfilling the employer's requests. This is often due to the fact that the men in charge are either not trained in selecting employes; are not familiar with the employer and his requirements or are willing to send out anyone available and let them take a chance. Unless such work is handled in a careful, business-like manner, by trained men, the result will be that after one or two trials the employer places his calls where his instructions are regarded.

Location Is Factor in Employment

The geographical location of an industry will play an important part in securing and keeping employes. One cannery in California is located at a considerable distance from districts producing the fruits or vegetables it handles but operates almost the entire year and with the same crew. It has no near competitor. Therefore instead of having a crew that is liable to leave, as soon as some nearby cannery offers a slight increase, it can depend on the same workers the year around. Many have their own homes and form a very efficient group. By managing to retain the same set of workers the cannery has increased its production and lowered its costs enough to offset the difference it pays in shipping charges on its produce.

Office appliance companies maintain employment departments in connection with their sales departments. Although this work is carried on by them in order to help promote sales and as a part of their advertising policy, it often serves as the only method by which employers are able to secure employes trained in handling some of the more technical office appliances. Typewriter companies specialize in handling stenographers and typists, adding machine companies in their products and others in like manner.

Some of these companies even go so far as to maintain training schools where young men and women are given free training in handling such appliances as dictaphones, comptometers, filing systems, etc., and from which the employer can secure a high grade of clerical help. Such service is generally free to both the employer and the employe and helps connect their students with reliable firms.

"Don't Buy It if You Have It in Stock"

One source from which employes can be recruited and which is too often overlooked is from within the ranks of those already on the pay roll and ready for advancement. Where the employes have this policy to look forward to, they are more willing to stick to their jobs than where they see new men brought in from the outside and placed on work to which they have been hoping to be promoted.

A good many nationally known companies pick their new employes from the ranks of the new college graduates and men of like type who have had no actual experience. This raw material is sent to training schools operated by the company and given thorough schooling in every phase of the product before being used either in office or on road work. Such courses naturally are expensive and often mean that a thousand or more dollars is spent on the man before he can produce any material returns but the investment proves worth while, for from such material come the future executives of the company.

Eliminating the Waste in Industry

Shortcuts in Management and New Power Applications Which Have Been Adopted in Western Industrial Plants for Eliminating Waste, Increasing Production and Cutting the Cost of Manufacturing Processes

By LOUIS F. LEUREY
Industrial Electrical Engineer

Portable Power Plant Developed For Oil Well Pumping

A very economical arrangement, in the way of a portable power plant, for well pumping, has just been developed by G. C. LaMarsna of Taft, California. The new rig to a notable extent does away with the time formerly lost in changing over, in the oil fields, from steam to electric drive.

During the early history of the California oil fields practically all installations for pumping were steam or gas driven, using oil or gas from the wells as a primary fuel. Due to the pioneer efforts of such companies as the San Joaquin Light & Power Corp. and several large electrical apparatus manufacturing companies, electricity as a motive power was gradually introduced into these fields until at present it has to a very large extent replaced the use of steam engines as a prime mover.

The rig herewith described consists of the usual wound rotor type motor for heavy starting duty which is mounted on a frame made of I beams and angle iron, the whole thing self-contained and ready to operate for the final connection to the service lines.

In actual practice, when one of these rigs is ready to replace the steam engine, the engine is pulled back about 30 feet and a concrete foundation with anchor bolts is set for the motor frame. The motor and all wiring are tested in the shop and when slipped in place on the concrete foundation approximately three hours only are required to stop the steam engine, shorten up the belt and start the motor on its permanent run.

In addition to the saving made in minimizing the shutdown, the rig is eminently fitted for rapid transportation to any point needed in the fields with the minimum cost of disconnection and re-installation.

Electricity is rapidly replacing steam in the oil fields as a means of pumping. In Kern county, California, there are approximately 3,000 wells operating at the present time, over 900 of which are being pumped by electricity. Operators are unanimous in agreeing that electric drive is by far the most economical power, not only on account of reduced cost of operation, but also on account of the increase in production by reason of uniform speed of the motor, a feat which cannot be accomplished with steam or gas engines.

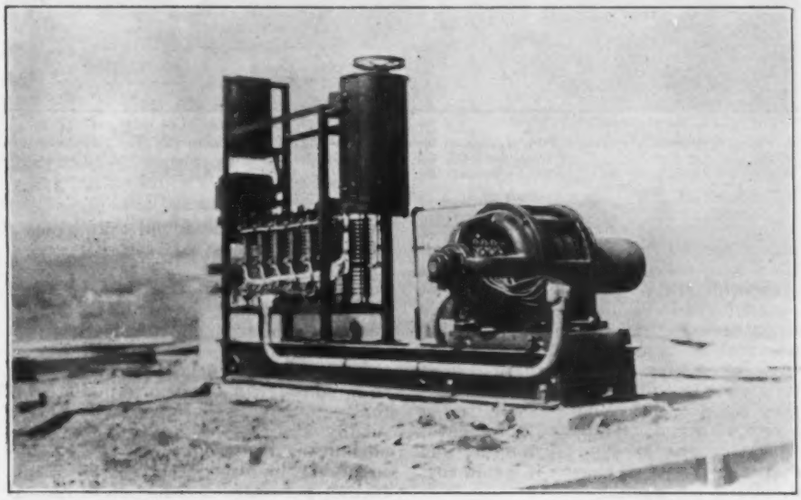
That electric motors are increasing in popularity is demonstrated by a recent inspection which shows that the Standard Oil Company recently installed thirty motors in the Elk Hills district and is planning to put into operation thirty-five more in the near future. The Pan-American Petroleum Company has already begun installing thirty-five motors at its wells. The Honolulu Oil Company is electrifying its entire holdings.

Present indications are that within the next two years electricity will entirely replace steam in the California oil fields. Motor drive is already used to a large extent in drilling operations.

The freedom from fire hazard is another strong point in favor of electricity.

THIS DEPARTMENT

will be devoted to a discussion of the various problems of waste in industry as they affect western industrial plants. Readers are asked to aid in the solution of the most vital problems facing industry by sending in accounts and pictures of the various practices for combating waste, which have been adopted in plants with which they are familiar. It is only by thus cooperating with Mr. Leurey that the fullest service can be rendered. Space rates will be paid for all material which is published.



The new portable rig developed by G. C. LaMarsna of Taft, California, which minimizes the time lost in changing from steam to electric drive. The power plant is assembled and tested in the shop and when the motor is fastened to its concrete base, the change can be made in three hours.

Insurance Against Destruction From Electrical Causes

There has recently been instituted, by a number of insurance companies, quite an active campaign of writing policies covering electrical equipment in industrial plants against destruction from electrical causes, as against the standard policies which insure only against destruction from fire.

The rates in this new type of policy are not founded on any great amount of experience at present and are largely experimental in character, and undoubtedly after certain experience has been acquired, they will be materially changed in many respects. Broadly speaking, these policies cover all motors at a uniform rate per hp. per annum, and do not to any extent differentiate between classes or conditions.

It is very obvious even from a superficial study of the question that a number of things must be considered before the plant manager can equate the value of this insurance in his particular case. First, apparently no differential is made between motors installed in a plant of inherent cleanliness, such as a modern flour mill, as against a plant handling acids or gases where motors are subjected to more destructive operating conditions. No differential is established between motors operating in cool and well ventilated factories as against motors operating in steam heated rooms.

Second, no apparent differential has yet been established between new motors just installed in a new factory and motors which have been operating for a number of years in an old factory.

Third, there is apparently no differential between motors of the same hp.

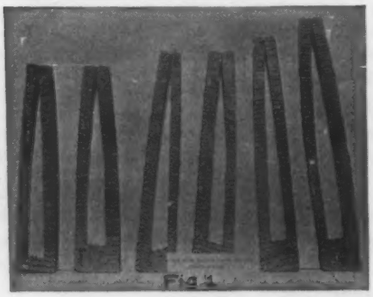
having different speeds and yet the high speed motors are inherently less costly than the slow speed motors of the same type.

Fourth, there is apparently no differential provided in plants where thoroughly qualified attendance is maintained at all hours as against those plants where no technical attendance is maintained.

Summing this up, it would seem that the greatest advantage of these policies, in their present form, would be to companies having a low order of maintenance and inherently severe conditions for electrical operation.

Improperly Dried Lumber May Be Salvaged by Use of Dry Kiln

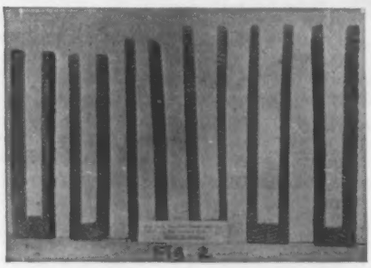
A large manufacturing concern whose specialty is electrical equipment purchased a quantity of quarter-sawed red oak which was to be used in one of its products. This lumber was what is commercially known as average air



Samples taken from the wood before kiln-drying, showing the distortion due to case-hardening.

dried—the drying being accomplished by stacking the lumber in the open for a certain period of time after it passed through the saw.

The manufacturing company, after finishing some of the electrical devices, found that they were not up to the necessary standard of quality and upon investigation, the trouble was traced to the poor condition of the air dried lumber. Samples cut from this lumber,



Samples taken from the same lumber after kiln-drying, showing how the distortion was overcome and that all stresses have been equalized.

as delivered from the mills, showed that it suffered from a form of distortion known as "case hardening," which is the result of over-drying of the surface of the wood without a corresponding drying out of the interior. These samples were cut in the shape of tuning forks. This, of course, produced unequal stress in the lumber, making it unfit for this special use.

After making certain laboratory tests to determine the condition, the remaining portion of the lumber stock was put into a high humidity dry kiln and after being put through this kiln for the proper amount of time, all of the case-hardened lumber was recovered in prime condition and it was used in the manufacturing process.

Manufacturers requiring lumber for specialty uses do not always realize the lack of uniformity which must necessarily exist in air dried lumber. It is manifest that if two samples of lumber are left out for a certain period of time though at different seasons of the year, the conditions of wind, sun and weather will make the two samples entirely dissimilar in the results obtained. The use of high humidity kilns appears to be one practical system by which uniformity of quality can be secured.

Material Waste Prevented by Using Electricity

Advantages of Electricity as Heating Agent in Baking Industry and Porcelain Enamel Factory Offset Higher Cost

In considering the use of electrical energy in manufacturing plants for heating purposes it is too often dismissed with only a superficial examination into its merits and frequently its dismissal is based solely on the fact that its primary value as a heating medium does not compare favorably with the use of fuels like gas, oil, and coal. In its secondary advantages, however, it very often develops savings so great as to more than counteract its deficiency from a purely thermal point of view, and in the final analysis its relative economy can only be equated in terms of dollars and cents cost in the manufactured article of the company.

A western bakery, showing a typical method used in installing an electric oven. The thermometers which register the heat of the oven are seen on the left of the machine. The control switches are located on the upper right hand corner of the oven.

In a recent electrical rate hearing before the Railroad Commission of California, a baking company, having a state-wide distribution of its products, asked for an equalization of electrical rates so that they could install baking ovens at equal cost in all parts of the state of California. In this hearing they gave testimony to the effect that they could operate one of their baking ovens with kerosene at $15 per month; with city gas at $30 per month; and that with electrical energy it would cost them $60 per month.

In spite of the much higher cost of electrical energy, this company's avowed policy was to install nothing but electrical ovens wherever these could be installed to operate at $60 per month, stating that the advantage of the use of electricity was three-fold: first, due to the extreme cleanliness of the electrical method of production; secondly, due to the absolute safety from odor and explosion; and third, due to the perfection of heat control which not only reduced waste to a minimum but by the conservation of moisture actually produced more pounds of bread per barrel of flour than any of the other methods of baking.

Similar to this case, a large porcelain enamel company, manufacturing plumbing specialties, has found that in spite of the higher cost of electricity, used as a primary fuel, the perfection of control is such that they have reduced their spoliage approximately 25 per cent, besides securing a more uniform character to their entire output. As all rejections in this class of goods have to go through a hand-chiseling process for removing the old enamel, it can be readily appreciated that this very important saving would more than discount the increased fuel cost, while it further permitted a reduction in capital investment by securing more output per kiln.

Western Dealer, Jobber and Agent

Business building suggestions for the store — Distribution and warehousing methods — Advertising and sales promotion ideas

"Beneficial Election Ballot" as a Prospect Getter

Denver Electrical Dealer Sends Out Imitation Ballots Enabling Recipients to "Vote" for Possible Purchasers

By JOHN T. BARTLETT

A "Beneficial Election Ballot" is an excellent plan during the election season to obtain a good clean list of vacuum cleaner or other appliance prospects. The Denver Gas & Electric Light Co. sent out, with great success, many thousands of such ballots prior to the 1920 election. The general idea elaborated at that time by Frank Kivel, advertising manager, can be readily adapted to any locality and any concern. Any sort of an election will endow the plan with the peculiarly effective characteristic of timeliness. It need not be a presidential election. A city, county, district or state election will suffice.

Mr. Kivel got up a sheet 11 inches by 16 inches in imitation of a regular ballot. In large type at the top were the words "THE HOOVER PARTY." There were also the words, "Beneficial Election Ballot," and, within parentheses, the explanation, "As Herbert C. Hoover was not nominated at the Republican Convention in Chicago we are going to give all parties a chance to designate THE HOOVER in our fall campaign."

The heading continued—

"HOW TO VOTE THIS TICKET AND WIN A HOOVER

"Your friends all want a Hoover. Write their names in the left hand column, tear off and mail to Publicity Department, The Denver Gas & Electric Light Co., Room 208.

"For the first list mailed, from which we make the largest number of sales, we will give you absolutely free—

"ONE HOOVER ELECTION SUCTION SWEEPER.

"The contest is open to any resident of Denver, not an employe of this company."

The ballot which the Denver resident mailed to the company occupied the column at the left, and as it was perforated it could be readily detached. It was headed at the top—

"(Write Your Name Plainly)

Date.....

I, ...

Address .....

vote for the following persons who are interested in

THE HOOVER

Name .....

Address ....."

Subjoined were blanks for the names and addresses of nine other prospects.

Spaces in the second and third columns were ruled off in imitation of a regular ballot—six in one column, three in the third. The balance of the second and third columns were filled with advertising matter, as was the entire fourth column.

The spaces contained material advertising the Hoover. Election phraseology was used. For example—

"Vote For
THE HOOVER
It Beats
As It Sweeps
As It Cleans."

or—

"Vote for THE HOOVER
It gets all the
Dirt Out of
Carpets and Rugs."

or—

"The Hoover Party
Endorsed by
12,000
Hoover Users
in Denver."

In another space, the reader was told that $5 on time payments would be saved by purchasing a Hoover during the campaign. Another square had the recommendation, "Phone Main 4000 for a free demonstration in your home."

Although the ballot seemed to say little directly about the Hoover, it really said a great deal, through the medium of trenchant statements in election-time language.

The ballots were sent out in a long envelope with a "teaser" inscription, **"Read This Ballot Carefully,"** under a 1c. Denver permit. There was no return card or other information to reveal the identity of the sender. A "teaser" is advertising parlance for a curiosity-arouser. Once curiosity or other motive had impelled the recipient to open the envelope and glance at the enclosure, the novel nature of the latter could be depended on to secure at least a reading from most people.

Under post office regulations, prizes cannot be divided. If a first prize is offered, for example, and several tie for it, post office regulations compel the contest holder to give the full first prize to each of those participating in the tie. The Denver Gas & Electric Light Co. guarded against such a contingency arising, by stipulating, as a contest condition, that the list first mailed, from which the largest number of sales was made, would get the prize. The possibility of a tie is one that any holder of a similar contest should be careful to guard against in contest conditions.

The Denver Gas & Electric Light Co. got excellent results from the contest, both in numbers of prospects secured and in the "quality" of them. There is every reason to believe the general plan would be successful for others, using it to secure prospects names for sweeper, washer, ironer, or other appliances.

LARGEST RESIDENTIAL STORE IN DENVER

Denver's largest residential electrical supply house is owned and operated by E. C. Headrick, the chairman of the Electrical Cooperative League of the city. All kinds of fixtures and appliances are carried in stock by the store, which does a thriving business throughout the year.

How the Suburban Dealer Can Compete with the City Store

THE small town contractor is realizing that if he is to prevent his customers from purchasing their goods in the cities, he must have his store on the same high merchandising plane as those of his urban competitors. The Reid-Farley Electric Company, Fullerton, Cal., has incorporated the latest merchandising ideas into its new store. Note the electric sign, the large windows and the smart appearance of the interior of the store. Note the arrangement of the material on the shelves, the separate department for fixture display in the rear and the rest room furnished in wickerware.

Better Business is Yours if You Go and Get It

Electragists and Salesmen Must Be Sold on Their Product and On the Look-out For Possible Purchasers

By M. C. TURPIN
Westinghouse Electric and Manufacturing Company

One year ago the curve of business was just about at its lowest point and we were all correspondingly depressed. Now things are looking brighter, the curve is on a decided upward trend and we are feeling much better. We begin to feel that perhaps the end of the world has not yet arrived and possibly there is something worth living for after all. But let us take a sensible view of the situation and not sit back and wait for business to be brought to us as we did in the "peak load" times just after the war. Business is better, it is true, but your share and my share is going to depend just exactly on the amount of personal effort you and I put into it. Competition is keen and is going to be keener, therefore we must exert every effort to get our proportion of the business we know awaits us. One of the weakest points in the electrical retail business, it seems to me, is the lack of enthusiasm our own people have for electrical appliances, and the lack of systematic effort we put forth to sell them. A few instances that have recently come under my observation will serve to convey this idea better than a lengthy discourse.

In discussing the question of electric ranges with a salesman, whose duty it was to sell ranges along with other electrical supplies, he made this astonishing statement: "Now, just between you and me (of course I don't say this outside), the electric range has no advantages over a gas range, and besides it costs a great deal more." Is it any wonder that a salesman in such a frame of mind does not sell many electric ranges?

In a campaign recently staged in a small town in Pennsylvania, a solicitor called on a woman living over the store of a prominent electragist and sold her an iron and a toaster. After the sale was made, the salesman inquired why she had not purchased the articles from the store over which she lived. She replied, "I didn't know that he sold them." Such instances might be multiplied indefinitely but those related above show how necessary it is for us to "sell" our own associates and neighbors if we would do a real job of selling.

Many electrical retail merchants have assured themselves that their sales people and clerks have all of the electrical devices in their own homes that they can afford. Would it prove to be a paying investment to offer them a liberal employes' discount—cost price, if necessary—to get them to use, in their own homes, the devices they are supposed to sell? Surely a saleslady can talk far more convincingly of the merits of a particular vacuum cleaner if she used one in her own home.

Frequently, we overlook an excellent opportunity to make an easy sale outside of business hours. Recently when in a small western town waiting for a train, an electrical salesman was eating his dinner in a Greek restaurant (you know, nowadays when "Greek meets Greek" they start a restaurant) he ordered some waffles and noticed the chef cooking them on a gas heated iron. The salesman asked for the proprietor, showed him a picture of an electric waffle iron and told him of its many advantages. The proprietor was duly impressed and the salesman left the restaurant with an order for three waffle irons which he turned over to the electrical retailer in the town. Undoubtedly the latter was one of those whose continuous complaint has been "Business is rotten," and yet here was a sale right under his nose but he couldn't detect it.

Business is here—plenty of it—if we will go out and get it, but don't let's sit around expecting it to be brought in to us on a silver platter.

Overhead vs. The Bended Arm

By JOE OSIER

A Chinese philosopher, who utilized the major portion of his time in herding a pig—

Peered through the brim of his rattan derby one day and pulled this one:

"With coarse food to eat, water to drink and the bended arm as a pillow, happiness may still exist."

I am almost tempted to believe, however, that this old philosopher was quoting some man of the electrical industry, in name only—

Who told the world and every member of his association that—

Overhead is a myth, invented solely to scare timid children and panicky old men.

Don't misunderstand me. I, too, think, in spite of the way this column reads, that happiness may be obtained and retained—

In spite of coarse food and water, but—

After hip-hipping for the 18th Amendment, reserving the tiger for Mr. Volstead—

I still insist that Overhead must be taken into consideration unless—

A sheriff's lock is urgently desired on the office door.

A bended arm will serve as a pillow in a pinch but, most of us,

I hereby depose—

Much prefer necking which has for its component parts, the proper amounts of feathers and linen.

Yea, fellow serfs!

Happiness may still exist no matter how humble the fare or mean the cot, still—

How much happier one can be parked behind savory viands or lying on a purple couch of ease—and—

These boons are within the reach of men of the trade—providing—

They look neither to the right nor left without first adding a liberal per cent for overhead—covering the cost of the wear and tear on the stub pencil and—

The shine on the trouser seat, caused from riding boards in ante rooms.

Let Overhead be the verse—Overhead the chorus. May happy voices ring out with this refrain until the heads of every manufacturing concern—

And banking institution—

In this Great Commonwealth, grasp each man of the trade—

By his toil worn hand and call him—

Friend and brother bolsheviki.

In many sections of these United States today, especially in the territories where—

Jobs have been as scarce as hens' bi-cuspids—

Since Bad Bill and his son the Clown Quince, quit cold—

Men of the industry have been found guilty of buying contracts.

In other words, they threw their hooks where there were no fish only to discover that—

They were giving a first class imitation of a sucker and, that the sack they were holding contained nothing but a—

Vast amount of emptiness.

They forgot for the moment that—

"There is a time to fish and a time to dry nets" and—

When they realized the truth of this wheeze, they came to know that—

They had transferred many "clanks,"

Ofttimes referred to as dollars—

From the profit pocket to the pouch with the bottomless pit.

Some men, I have discovered, benefit from their experiences; others "hang tuff" until—

Their goods and chattels are sold under the hammer—then—

They resurrect their old clothes and renew their acquaintance with—

The boys who do the heavy lifting.

Oh, well! They still have the bended arm.

Northern Court Decides License Law for Electricians

According to an opinion rendered by Assistant Attorney-General O. R. Schumann at Olympia, the electricians' license law applies to independent contractors, and not to electricians who may be permanently employed to take care of a large concern's electrical work, or to an owner of property who employs an electrician by the day to wire his building, the owner furnishing all materials necessary. The rule of master and servant governs in determining whether license is required, the opinion says.

The bond provision of the law is to protect parties with whom electricians contract against damages for failure to comply with laws and ordinances, and against liens for labor and materials, and when the relations of master and servant occur, the former retaining full control, not only as to the final result of the work but as to the means whereby it is accomplished, the bond would seem to be a superfluous requirement, the opinion holds.

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers—Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

Thirty Millions to Be Spent By Southern Pacific Company

Calling for an expenditure of nearly thirty million dollars, the Southern Pacific Company has an extensive program of betterment, construction, and addition for its Pacific System, during the remaining months of 1922. The policy of the company is to anticipate the needs of the shipping and traveling public, and the outlay which the company will make is to better the roadbed and rolling stock materially.

Two hundred and ninety miles of track will be relaid with 90-lb. rails, 2,518,000 new cross-ties will replace old ones, and 80,000 cu. yd. of ballast will be used to reinforce the roadbed. Many new sidings have been installed to handle the long 55-car freight trains which are now operating over the Sierra Nevada Mountains. The roadbed over the Tehachapi Mountains is to be double-tracked, the portions from Bakersfield to Sivert and from Tehachapi to Cameron are now under construction. Many tunnels are being enlarged and relined.

The Southern Pacific Company has ordered for delivery, or is making in its own shops, 63 new locomotives, which are to be ready for service during the present year. About nine thousand five hundred new cars of every description will have been added by the end of the year.

Two large electric turntables have been installed already and a third is being built. The two completed ones are at Dunsmuir and Ashland, while the one under construction is at Siskiyou. A turntable of similar dimensions is also to be built at San Luis Obispo.

Important plans for large expenditures for 1923 have already been made by Southern Pacific officials. From data available the program for the next year should be even more extensive than any so far.

Public Utilities Must Use Steel Poles in Salt Lake City

Further use of wooden poles by public utility companies is forbidden on paved streets and streets about to be paved, in Salt Lake City, under a recent decision of the city commission.

While there is no intention to compel a wholesale removal of wooden poles immediately, replacements must be made with steel poles.

The Beaverhead Transmission Company of Butte, Montana, recently filed articles of incorporation in that state. The company will transact a general light and power business in the state for a period of 40 years. The directors are: Walter J. Forsythe, Irving H. Bolitho and Elmer H. Mester.

Pit No. 1 Plant to Open September 30

Ninety-three thousand horsepower of electrical energy will be turned into the interconnected systems of California on September 30, when Pit No. One plant of the Pacific Gas and Electric Company is officially dedicated. Water was turned into the two-mile tunnel during the past two weeks and generating equipment was given a thorough tryout. The equipment is reported to be in perfect order.

Elaborate preparations are being made for the dedication of the plant, which will be attended by officials of the company and a number of notable guests.

For the present power will be transmitted at 165,000 volts although the lines were constructed for operation at 220,000 volts, a new world's record. It is expected that the higher voltage will be used early in 1923.

Valuation Engineers Needed By Bureau of Internal Revenue

To secure accurate valuations of many of the industries of the country, the technical staff of the Bureau of Internal Revenue at Washington is in need of valuation engineers in general mining, coal mining, oil and gas and the forest industry. The United States Civil Service Commission will receive applications until October 1. Duties involve estimation of quantities, market values, value of equipment, cost of development, etc. No written examination will be given. Salaries range from $3,600 to $4,800 per year.

To Erect Hydroelectric Plant at Buffalo Rapids

The Yellowstone Land, Power and Irrigation Company has been organized in Miles City, Montana, to develop a hydroelectric plant at the Buffalo Rapids in that state. The plant will be nine miles east of Miles City and will supply power to that city and a number of eastern Montana cities.

The Buffalo Rapids project provides for a low head development with installed capacity of 17,400 hp. comprising eight units of 2,190 hp. each. In addition to the municipal and industrial installations, power will be provided for the reclamation of 109,000 acres along the Yellowstone River.

Long-Bell Lumber Company Will Build Town on Columbia River

The Long-Bell Lumber Company of Kansas City has started the construction of an entirely new city along the Columbia River in the state of Washington, near the town of Kelso, to provide housing facilities for the company's 4,000 employes, who will work in the lumber mills to be erected at that point. The company owns 70,000 acres of fir timber, which will be manufactured into lumber, and the principal lumber activities of the company in the South will be transferred to Washington.

According to R. A. Long, president of the lumber company, the firm will build two huge mills on the Columbia River, which will have a combined capacity of 600,000,000 ft. of lumber annually. The first of these plants will be under way immediately.

The company will invite other industries to locate in the vicinity, and will not attempt to make it a one-industry town. The location is ideal for shipping lumber, with seven and one-half miles of water front on the Columbia River which can be reached by heavy freight liners from the Pacific Ocean, and five miles of frontage on the Cowlitz River. Three trunk line railroads are adjacent to the town.

Paper and Pulp Mill Is Under Construction at Denver

Construction of a $500,000 paper mill has been started at Denver, Colorado. The mill, which is being built by the Myers Pulp and Paper Company, will consist of six buildings. A box factory, which will take the entire initial output of the paper mill is being built in conjunction with the plant. The box factory will consist of three units which will cost in the neighborhood of $35,000 each.

Power contracts for the new mill have been let for a 10-year period. A thoroughly modern electrical installation will be made in the two new plants.

The officers and directors of the Myers Pulp and Paper Company are: Charles B. Myers of Chicago, president; A. E. Millington, vice-president; Wilbur F. Denious, secretary and treasurer; C. R. Rudy, sales manager and director, and Thomas F. Carey, director.

Plans for an expenditure of $2,150,000 during the year for the Denver & Rio Grande Western railroad lines, have have been announced by Joseph H. Young, receiver for the railroad. Two hundred and forty-seven miles of new rail will be laid to replace lighter steel. Improvements are also to be made to the motive power of the railroad.

Hasten Stockton Development by New Spur Track

Western Pacific Railroad Company Puts in Six Miles of Trackage Enclosing Area of More Than Four Square Miles

Before the heavy rains of the winter set in, the Western Pacific Railroad Company hopes to have completed its new industrial trackage at Stockton, California. Contracts have been awarded to the Utah Construction Company and grading operations began August 28. The new trackage will be over six miles in length, and 85-lb. steel will be used throughout. Thomas L. Phillips, construction engineer, will have charge for the company.

Designated officially as the "North Channel Spur," this project is in reality a terminal proposition, which, it is estimated, can easily accommodate the industrial needs of a city of a quarter of a million people or more.

All of the franchises and rights have been obtained, and practically all of the right-of-way was bought before the contracts were awarded. The final obstacle to construction was passed when the State Railroad Commission recently granted the Western Pacific the right to cross the Lower Sacramento Road at grade.

The new industrial track leaves the main line of the Western Pacific at a point more than two miles north of the heart of Stockton. The track will be laid in a westerly direction for over two miles, at one point skirting the Calaveras River. Then the track will turn almost due south, for about two miles, continuing until it reaches the north side of the Stockton Channel. Then it turns easterly for about two miles, along the northern side of Stockton Channel. In this section the track will be from 100 to 200 feet from the water's edge, giving ample space for industries that require both rail and water facilities.

In planning this improvement, Colonel J. W. Williams, chief engineer of the Western Pacific Railroad, has followed the principle on which the San Jose Belt Line was constructed. In San Jose the Western Pacific's belt line encloses the city on the east, south and west, the length being nearly six miles. In Stockton the Western Pacific brings into use several square miles of new industrial land, now used largely for agricultural purposes, and makes available two miles of water front, at present not in use.

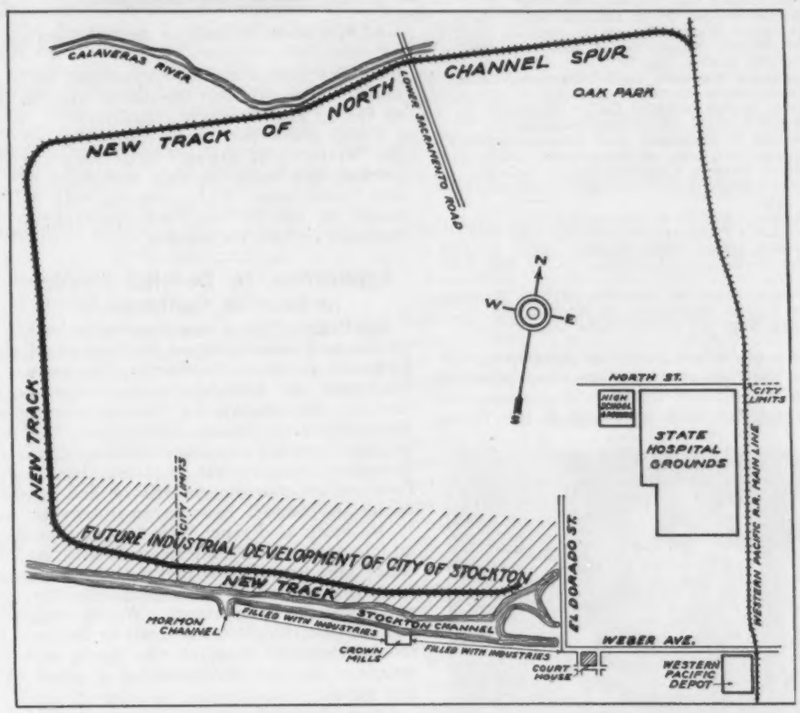


Chart showing the new $300,000 industrial line being constructed by the Western Pacific Railroad Company to bring about the development of the area along the north bank of the Stockton Channel. The district designed for the future development of the city of Stockton is also shown.

Stockton's water front that is employed at present, includes the south side of Stockton Channel from its easterly terminus to the intersection with Mormon Channel. Some industries are located on Mormon Channel but the busy district is this south side of the Channel, which from a railroad standpoint, is served by the Southern Pacific, the Western Pacific and the Santa Fe railroad.

Most of the land enclosed by the North Channel Spur is vacant and is immediately available for industries. There is a residential quarter northwest of the court house—shown on the map—but the area occupied by homes is relatively small.

Senate Passes Tariff Amendment to Adopt Free Trade Zones

Establishment of foreign trade zones at a number of American ports is practically assured by the action of the Senate on August 16 in adopting an amendment to the tariff bill which would authorize their creation. To remove some of the objections voiced against the proposal, the Senate eliminated the authority permitting the establishment of manufacturing enterprises within the free zone.

Under the provisions of the amendment it will be possible to store, exhibit, break-up, repack, assemble, distribute, sort, refine, grade, clean, mix and otherwise manipulate foreign or domestic merchandise in an area where no compliance with the laws and regulations governing the entry of merchandise will be required.

At present, all goods landed in this country must pass through the custom house. If the goods are declared, ninety-nine per cent of the duty is refunded. However, the delay and red tape that is encountered, in addition to the one per cent duty, is very annoying. As a result of this many ships come to the United States in ballast, while, if the free ports are adopted, these vessels will bring foreign goods here to be trans-shipped along with American goods.

San Francisco has been suggested by the Tariff Commission as one of the ports best adapted to a trial of the free-zone plan.

Seattle Electric Week Plans Are Nearing Completion

Plans for Seattle's "Electric Week," September 22-29, are rapidly swinging into shape, and arrangements for the two model electric homes are practically completed. Burton R. Stare has been appointed chairman of the two model homes, with Walter E. Jones and Phillip F. Apfel, his chief assistants. In addition there are approximately 300 supervisors, lecturers and attendants on the staff

The finance committee for electrical week is completing arrangements to finance the whole undertaking in advance. Nothing is to be offered for sale, neither will there be solicitation of any kind in the homes, nor any advertising of the fixtures and appliances in use. Roy Worth is chairman of the finance committee, assisted by R. W. Cole, C. E. McCain, H. E. Bailey, P. A. Putraw, C. H. Birkel, J. R. Barry, Fred B. Lushington, John Hayes, H. A. Boring, B. R. Stare, Harry Martin, R. D. Constable and W. W. What. W. M. Meacham is chairman of the appliance and fixture committee, assisted by W. E. Jones and P. J. Aaron, with others to be named.

The houses will be furnished by the Standard Furniture Company, who will cooperate with the electrical committee to make the furnishing harmonize with the electrical effect. House Manager Jones has appointed the following to supervise his home: L. R. Grant, Puget Sound Power & Light Co., James Maitland, Electrical Engineering Co., Fred Lushington, Lushington Electric Co., and C. D .Cunningham, Globe Electric Company.

Salt Lake Exposition Plans Nearing Completion

Committees for Rocky Mountain Electrical Display October 2 to 14 are Announced and Already Working

Plans are rapidly nearing completion for the Rocky Mountain Electrical Exposition to be held in Salt Lake City October 2 to 14. A complete organization of committees has been effected and indications are that the enterprise will be one of the most effective ever held in the West.

The personnel of these committees is as follows:

General Exposition Committee—A. M. Jackson, chairman; P. M. Parry (ex-officio chairman of the Advisory Committee of League), J. A. Kahn, W. A. Moser, E. H. Eardley and R. M. Bleak.

Officers—A. M. Jackson, manager; P. L. Goddard, secretary, and R. C. Nash, treasurer.

Exhibits Committee—H. M. Ferguson, chairman; Earl Morgan, decorations; Geo. R. Randall, booths, wiring and lighting; Geo. P. Traynor, concessions; J. A. Twelves, policing, cleaning and parking; A. J. Callaway, receiving goods; and P. L. Goddard, A. M. Jackson and L. B. Johnson, in charge of sale of space.

Features (sub-committee under Exhibits Committee)—P. P. Ashworth, chairman; E. Bachman, M. R. Davis, R. N. Emerson, C. R. Higson, L. R. Gamble, P. A. Jeanne, J. G. McCollom, Dr. Jos. F. Merrill, J. C. Paynter, H. T. Plumb, C. C. Pratt and Orin Tugman.

Finance Committee—W. S. Hodgson, chairman; R. H. Jones and C. B. Richmond.

Advertising and Publicity Committee—M. L. Cummings, Jr., chairman; P. L. Goddard and S. A. Stevens.

Arch and Searchlight Committee—C. R. Higson, chairman; E. L. Dee and H. S. Evans.

Music Committee—E. L. Dee and H. S. Evans.

Commercial Club and Chamber of Commerce, Salt Lake City—Harry L. Bracken, chairman; M. R. Ballard, M. B. Boothby, John H. Burrows, E. C. Coffin and J. H. Rayburn.

Cooperating with Engineering Organizations—H. T. Plumb.

Cooperating with Commercial Organizations—H. F. Dicke.

Exhibitors are arranging for booth space at a rapid rate, which indicates a very keen interest in the exposition from the viewpoint of the electrical interests, and assures a wonderful array of intensely interesting and educational features.

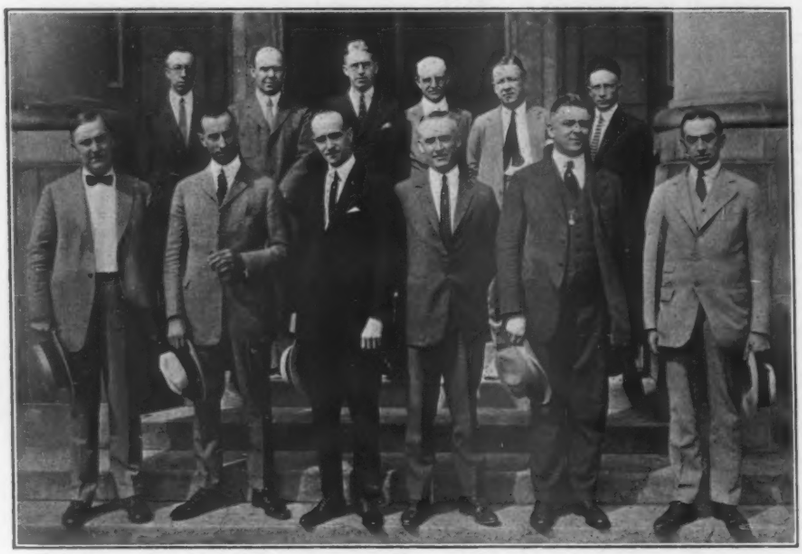
A partial list of exhibitors follows:

Edison Lamp Works of General Electric Co.
United Electric Supply Co. of Salt Lake City
Utah Power & Light Co. of Salt Lake City
Eureka Vacuum Cleaner Co. of Detroit.
Capital Electric Co. of Salt Lake City
Intermountain Electric Co. of Salt Lake City
Dodge Bros. Electric Co. of Salt Lake City
Thor Electric Shop (Hurley Machine Co. of Chicago)
Locke Insulator Corporation of Victor, N. Y.
Mine & Smelter Supply Co. of Salt Lake City and Denver
B. & G. Electric Shop, of Salt Lake City
Salt Lake Electric Supply Co. of Salt Lake City
Woodrow Manufacturing Co. of Newton, Ia.
Eardley Electric Co. of Salt Lake City
Wasatch Electric Co. of Salt Lake City
Zion's Cooperative Mercantile Institution, of Salt Lake City
General Electric Co.
Consolidated Music Co. of Salt Lake City
Westinghouse Lamp Co.
H. G. Weeks Mfg. Co. of Hamilton, Ohio
Ohio Brass Co. of Mansfield, Ohio
Utah Cooper Co., of Salt Lake City
Coffield Washer Co. of Dayton, Ohio
Automatic Washer Co. of Newton, Ia.
Felt Electric Supply Co. of Salt Lake City
Western Electric Co.
American Wiremold Co. of Hartford, Conn.
Westinghouse Electric & Mfg. Co.
White Sewing Machine Co. of Cleveland
Pacific Electric Co. of San Francisco
Journal of Electricity and Western Industry
Meadows Mfg. Co. of Bloomington, Ill.
Edison Electric Appliance Co. of Chicago
Oregon Short Line Railroad Co. of Salt Lake City
Altorfer Bros. Co. of Peoria, Ill.
Salt Lake Hardware Co. of Salt Lake City
Western Union Telegraph Co.
Strevell—Paterson Hardware Co. of Salt Lake City
Landers, Frary & Clark Co. of San Francisco
One Minute Washer Co. of Newton, Ia.
Cullen Mfg. Co. of Salt Lake City

An elaborate publicity program, with the view of securing an attendance at the Exposition which will surpass all records for such an event in the West, is being inaugurated through newspaper advertising, billboards, window cards, window displays, mailing "stuffers," dodgers, banners, circular letters, etc., not only in the territory immediately surrounding Salt Lake City, but throughout the Intermountain section. This campaign, together with the fact that the semi-annual Mormon conference and the Utah State Fair will take place in Salt Lake City during part of the same period as the Exposition, will undoubtedly produce wonderful results as far as attendance is concerned.

A. M. Jackson, Manager of the Exposition

Final plans for the construction of the "archway of jewels" have been approved, and work on this structure is now under way. This archway will, in itself, be one of the real spectacular features of the Exposition.



Members and officers of the general committee in charge of the Rocky Mountain Electrical Exposition to be held in Salt Lake City, October 2 to 14. Top row, left to right: R. C. Nash, auditor, Capital Electric Co., P. M. Parry, commercial manager, Utah Power & Light Co., R. M. Bleak, superintendent lighting and appliance sales, Utah Power & Light Co., C. R. Higson, engineering department, Utah Power & Light Co., W. S. Hodgson, auditor, Utah Power & Light Co., H. L. Bracken, president H. L. Bracken Co. Bottom row, left to right: H. M. Ferguson, manager Salt Lake Division, Utah Power & Light Co., W. A. Moser, district manager, Westinghouse Electric & Manufacturing Co., P. L. Goddard, executive secretary, Rocky Mountain Electrical Cooperative League, M. L. Cummings, Jr., commercial department, Utah Power & Light Co., E. H. Eardley, president Eardley Electric Co., J. A. Kahn, president Capital Electric Co.

Application to Develop Power in Eastern California

Application for a comprehensive irrigation and power project in Placer and Eldorado counties, California, has been filed with the Federal Power Commission at Washington by the American River Power & Water Company. The project includes the construction of a diversion dam in the Rubicon River, from which the water will be led by canal and tunnel to a large reservoir to be built at French Meadow, in the middle fork of the American River. A canal and tunnel will carry the water from this dam to a power house on the north fork of the river. Water will also be brought to this power house from the north fork of the river, by means of another diversion dam, tunnel and canal.

From this power house the water will be conveyed, by means of canals and tunnels, to three other power houses on the north fork and main stream of the American River. The stored water after passing through the last power house will be used to irrigate lands below Auburn, in Placer and Sacramento counties. The company estimates that 188,000 hp. will be developed.

Progress is being made in boring into Kilauea crater in the Hawaiian Islands, in order to secure heat and power from the volcano. When the men boring into the lava had reached a longitudinal distance of 46 ft. a temperature of 150 degrees F. was recorded. On going 19 ft. deeper no perceptible increase in temperature was found. This upsets the theory that the temperature would increase at the rate of two degrees F. with each foot that the hole was sunk.

Salt Lake Railroad to Build New Terminal Facilities

Actual construction of the passenger depot of the Salt Lake Terminal Company in Salt Lake City, at the southwest corner of West Temple and South Temple streets, will commence as soon as the necessary changes can be made in the drawings and contracts for the work let. The structure will cost approximately $200,000.

This announcement has been made by W. C. Orem, president and general manager of the Salt Lake & Utah Railroad, which company, otgether with the Bamberger Electric Railroad, forms the Terminal company. Sale of certain bonds upon which work on the building has been pending, has resulted in the above announcement.

The building will be two stories above the ground with a frontage of 194 ft. on West Temple street and ninety-two ft. on South Temple. It has been decided to construct the building so that six or eight stories may be added.

Young and Hanson, of Salt Lake City, are the architects.

The basement floor of the building will be occupied by express and baggage rooms, with ample rooms for trainmen and other employes. The first floor will be arranged for waiting rooms, ticket offices and various business establishments. The second floor will be given over to offices of the two electric lines.

Construction work is expected to be completed not later than next spring.

Association Formed by Vancouver Small Residence Wiremen

After months of effort on the part of the fieldman of the Electrical Service League, the small residence wiremen of Vancouver have organized the Electrical Contractors' Association of British Columbia. This organization is entirely independent of any existing electrical contractors' association, but is formed for the specific purpose of bettering conditions among the residence wiremen.

The following officers were elected August 1, to serve for a period of six months: President, A. M. Buck; secretary-treasurer, Jas. Holt; executive committee, H. B. Steeves, M. J. Johnson of Johnson Electric, and A. P. Safford of Crosby and Safford.

Two Tuesday evenings each month are set aside for meetings, which are held in the rooms of the National Association.

L. A. Gas & Electric Corporation Erects Three Gas Generators

Taxed to capacity by an increase of 126 per cent over gas sales for 1915, the Los Angeles Gas and Electric Corporation is installing a battery of three gas generating sets to take care of the peak load that is expected this winter. Both gas and electric sales have increased over 1915, the year taken as a base. Sales of gas have increased more than the number of meters in a ratio of about three to one.

The new apparatus is to consist of three gas generating sets, each having two shells 27 ft. in diameter, by 45 ft. high, with a normal rated capacity of 7,000,000 cu. ft. every 24 hours. The generators will be the largest of their type in the world and will be fitted with all labor and money-saving devices. One waste heat boiler is being installed, thereby making use of the heat used in blasting. This is the first time that these boilers have been used with oil-gas-generating apparatus. Water is being developed by means of an underground gallery.

Vancouver Calls for Tenders on Electric Dock Equipment

The Harbor Board of Vancouver has just called for bids for the supply and installation of complete electric equipment and cargo lifting plant for the new $2,000,000 Ballantyne Pier, being erected in that city. The equipment specified by A. D. Swan, harbor engineer of Montreal consulting engineer for the Harbor Board, includes semi-portable electric cranes, electric freight elevators, electric escalators, electric capstans, tractors and trailers.

This electrically operated equipment, together with an elaborate lighting system, will allow cargo to be handled from ship to dock, or from dock to ship, at any hour of the day or night and will give Vancouver the best equipped dock on the North Pacific Coast.

It is roughly estimated that this equipment will cost in the neighborhood of $250,000. Bids will be received up till noon of Monday, October 2, 1922.

Reduction of Municipal Lighting Rates For Seattle By 1923

According to the superintendent of lighting, J. D. Ross, Seattle municipal lighting rates will probably be reduced early in 1923. The department is working on a revision of rates and the reduction will probably be accomplished early next year.

The city reduced its industrial rates in May about 25 per cent, and Mr. Ross states that instead of showing a temporary loss as anticipated, the change has resulted in a gain. In April the industrial power furnished was 1,747,059 kilowatt-hours, and the receipts $37,165.80. In May the reduction was made, and the June report shows 2,004,834 kilowatt-hours furnished, with receipts of $37,878.35, or virtually $700 increase.

With the cost of fuel oil now at $1.30 a barrel, and with the first unit of the Skagit plant in prospect for the last of next year, or the first of 1924, the light department is preparing to cut off the first 5,000 kw. of power now taken from the Puget Sound Light & Power Company, under the street railway contract.

Exhibits of the Great Western Power Company filed before the California Railroad Commission in a recent rate hearing show a valuation of $69,516,725 for its total operative properties. This amount included the entire cost of the big Caribou development which was completed in May, 1921. Other items that made up the total included lands, hydroelectric plants, transmission and distribution systems, substations, material and supplies, etc., but did not include lands and other properties, which, though owned by the company, are not considered operative.

Experiments With a New Design of Impulse Wheel

Experiments made recently at the Philadelphia plant of the William Cramp & Sons Ship & Engine Building Company by the I. P. Morris department and their associate, the Pelton Water Wheel Company, are said to have demonstrated the success of water wheels built according to a design radically different from anything heretofore on the market. Small wheels of the new type for test purposes have shown higher efficiencies than can be expected from impulse wheels of ordinary design and are said to be efficient over a wide range of heads, including those in the neighborhood of 800 to 1,000 ft. where the relative merits of reaction and impulse types are frequently in dispute.

The new design follows the principle of the impulse wheel, but instead of a jet or jets tangentially disposed to the periphery of the runner, the flow in the new design is normal to the runner plane. Further, instead of one or more separate jets to which the buckets are subjected during only part of a revolution, the new design applies the spouting water to all the buckets simultaneously and continuously around the entire periphery of the wheel, that is, the water reaches the runner in the form of an annular ring whose diameter is equal to the diameter of the runner. The flow in this annual ring contains both tangential and axial components.

Regulation is effected by an annular plunger moving axially to close the orifice of the nozzle. A section through the annular nozzle as taken in a plane containing the turbine axis shows a contracting water passage somewhat similar in form to a section through the ordinary needle nozzle. A point of difference, of course, is represented by the tangential velocity components about the axis of the jet which are not present in the jet from the ordinary needle nozzle. Air is freely admitted to both the inner and outer surfaces of the jet and the water does not completely fill the runner buckets, but is in contact with only one surface of each bucket, that is, the action is that of a true impulse turbine.

The advantage of the impulse turbine is therefore claimed for the new design in that changes of pressure through the runner are avoided and there are no forced changes of the relative velocity of the water with respect to the buckets as are required in a reaction turbine where the stream must completely fill the area of the conduit at all points. Therefore, the risk of cavitation due to sudden variations in pressure within the bucket is eliminated, and there is no leakage loss due to poorly fitted or worn seal rings.

Runners for wheels of this design can be built of extremely small diameters, it is claimed, as compared to impulse wheels of ordinary design, and units of this type are to be put on the market in commercial sizes as soon as the present experiments are completed and details of construction in larger sizes have been worked out. Two types of the new design are being studied; one of these was developed by H. Birchard Taylor and the other by Lewis F. Moody.

Investment Bankers Are to Make Visit to Kerckhoff Dam

When the members of the Investment Bankers Association of America reach California early next month enroute to the eleventh annual convention to be held at Del Monte, one of the first long stops of the six special trains conveying them will be at Fresno, from which a side trip will be made to Kerckhoff Dam. The visitors will be the guests of the San Joaquin Light and Power Company at luncheon.

This side trip was planned to give the eastern bankers an opportunity to see at first hand the physical resources of one of California's great hydroelectric power projects. California and the West occupy so outstanding a place in the hydroelectric field, developed and potential, that the convention committee of the California group determined that the membership of the association, representing men who handle a billion and a half dollars worth of investment securities annually, should see for themselves what has been done with the proceeds of California public utility bond issues which they have helped to market.

The irrigated districts around Fresno will also be viewd. On the itinerary are Sacramento, Los Angeles, and Santa Barbara, with a day in San Francisco after the close of the convention.

The committee in charge of the convention comprises Cyrus Peirce, of Cyrus Peirce & Company, chairman; Robert E. Hunter, of Hunter, Dulin & Co.; J. E. Jardine, of Wm. R. Staats Co.; LeRoy T. Ryone, of Ryone & Co.; G. C. Stephens, of Stephens & Co.; R. H. Moulton, of R. H. Moulton & Co.; and Dean G. Witter, of Blyth, Witter & Co.

Association Representatives Stir Interest in Cooperation

Cooperation in the electrical industry in British Columbia has taken on an added impetus since the visit of Laurence W. Davis, representative of the National Association of Electrical Contractors and Dealers, and Kenneth A. McIntyre, Canadian representative of the Society for Electrical Development, Inc., of New York.

Arriving in Vancouver August 14, they were the guests of the Advisory Council of the Electrical Service League of British Columbia. Monday evening they addressed the representatives of every branch of the industry at a dinner given under the auspices of the Electrical Service League of British Columbia. Mr. McIntyre spoke upon "The Value of an Electric Home to the Electrical Industry" and Mr. Davis upon "Cooperative Associations in the Electrical Industry." Tuesday evening Mr. Davis addressed a joint meeting of the members of the National Association of Electrical Contractors and Dealers and members of the small non-association electrical contractors' club.

The direct result of these meetings in Vancouver has been to increase membership in the National Association of Electrical Contractors and Dealers' Association and to gain the more united support of the contractors for the Electrical Service League of British Columbia.

Wednesday Mr. McIntyre and Mr. Davis, with Sid Smith, assistant district manager of the Canadian General Electric, W. W. Fraser, past president of the local branch of the National Association of Electrical Contractors and Dealers' Association, and Rey E. Chatfield, secretary-manager of the Electrical Service League of British Columbia, went to Victoria and there addressed the members of the Electrical Association of Victoria, B. C., at a dinner held in the Dominion Hotel.

Previous to this visit of Mr. Davis and Mr. McIntyre to Victoria, the contractors of that city could not be interested in association work. At the conclusion of the dinner every contractor present became a member of the National Association. In addition the central station took out an association membership in the National Association.

Will Install World's Largest High Tension Switches

The largest high tension electric switches ever built are now being installed by the Pacific Gas and Electric Company in its Pit River hydroelectric development. These switches, six in number, weigh upwards of thirty tons each and are nearly eighteen feet high. Approximately 2,000 gallons of oil, used as an insulating medium, are required for each switch.

The switches were specially built by the Westinghouse Electric and Manufacturing Company at East Pittsburg, Pa., and are being installed at both ends of the 220,000-volt line, now under construction by the P. G. & E. Co. through the upper Sacramento Valley. Three switches will be placed in service at Pit No. 1 power house in Shasta county, and three at the company's Vaca Substation, near Dixon.

While the switches are designed to operate on a 220,000-volt system, they have been subjected to a test of 350,000 volts, over fifty per cent higher than the normal operating voltage. In addition to being the largest in actual size, the switches are also constructed to break the highest voltage current ever utilized in a commercial way.

The Tacoma Electrical Club, Tacoma, recently held a meeting attended by more than 50 electrical contractors, at which time methods of efficiency were explained. Kenneth McIntyre of Toronto, representative of the Society for Electrical Development, Inc., and Laurence W .Davis of New York, special representative of the National Association of Electrical Contractors and Dealers, were the speakers.

A franchise providing for the furnishing of light and power to the city of Veronia, Oregon, was recently presented to the city council of the city, by George J. Burdick, who represented a company desirous of installing a small hydroelectric plant on Rock Creek. The company submitting the franchise plans to build a dam on Rock Creek about nine miles above Veronia, where 1,500 hp. can be developed. The cost of construction, it is estimated, will be approximately $80,000.

Books and Bulletins

PRINCIPLES OF ELECTRICAL ENGINEERING

By WILLIAM H. TIMBLE and VANNEVAR BUSH, associate professors of electrical engineering, Massachusetts Institute of Technology. 6 by 8 in., 513 pp. 241 charts, diagrams and illustrations. $4. John Wiley & Sons, Inc., New York.

Aiming to provide a first course in the subject in a really understandable form, this book presents the basic principles upon which modern electrical engineering rests. In furtherance of this purpose, many problems and examples from current engineering practice are introduced. The book has five special features which recommend it. The subject of the magnetic circuit has been particularly stressed. The modern electron theory has been freely used as a basis of explanation. The subjects of thermionic emission, conduction through gases, electrolytic conduction and certain high frequency phenomena have been introduced. The subject of the behavior of dielectrics has been approached in a new manner and five hundred live problems have been introduced for illustration. All of these make the book valuable as a text. It is written primarily for students of college grade and presumes a knowledge of calculus and physics.

New Rating Book Published

A new edition of Moody's Public Utility Rating Book has just come off the press. The new issue contains the latest financial statements and earnings reports of public service enterprises of every kind in this country and Canada as well as the prominent foreign concerns.

Moody's Public Utility Rating Book is a descriptive manual on corporatiions and securities published for investors. Analyses of securities published for investors. Analyses of securities are presented and a definite investment rating is assigned to every bond and stock issue.

For many years Moody's Rating Books were used mainly by banks, financial houses and investors, but recently the Public Utility volume has come into general use upon the part of officers and managers of electric light and power, traction, gas, water, telephone and telegraph companies.

The Public Utility Rating Book is one of a series of four volumes, the other sections covering Industrial, Government and Municipal securities, and Railroads. The Industrial Book for 1922 was issued early this summer, while the Government and Municipal and Railroad Books will be out within the next few weeks. These books are sold by Moody's Investors Service, 35 Nassau Street, New York, at $20 each or $80 for the set of four volumes, including monthly supplements.

A favorable report has been made by the engineers of the Arizona mining companies on the proposed power development by the Salt River Valley Water Users' Association below Roosevelt dam.

Meetings of Interest to Western Men

Successful Dinner Sponsored by S. F. Electrical Industry

Characterized as the most successful meeting ever sponsored by the electrical industry of San Francisco, the first of a series of "get-together" dinners to be held throughout the coming winter was held at the San Francisco Commercial Club on September 7. Lawrence W. Davis, special representative of the National Association of Electrical Contractors and Dealers, and Kenneth McIntyre, field representative of the Society for Electrical Development, Inc., were the guests of honor.

Charles W. Helser, president of the California Development Association, one of the speakers of the evening, delivered an eloquent address in which he roundly condemned the proposed California Water and Power Act which will come before the California voters in the November election. Before the meeting adjourned a resolution was passed voicing disapproval of the proposed measure.

The speakers of the evening consisted of Mr. Davis and Mr. McIntyre, both of whom spoke on the functions of the organizations which they represent, Mr. Helser, and Earl Fisher, chairman of the advisory committee of the California Electrical Cooperative Campaign, who outlined the work of the campaign for the coming year. John A. Britton, first vice-president and general manager of the Pacific Gas and Electric Company, acted as toastmaster.

The dinner was attended by approximately 300 members of the electrical fraternity of San Francisco and Oakland.

Dexter S. Kimball Speaks Before Engineers of Ogden

Dexter S. Kimball, dean of engineering at Cornell University and president of the American Society of Mechanical Engineers, was the principal speaker before the Ogden chapter of the American Association of Engineers at the Weber Club August 7. Members of the University Club of Ogden also attended the meeting and banquet.

President Kimball addressed the engineers on the "Industrial Situation."

In his address he emphasized the fact that a change must be made in production and distribution methods immediately if the country is to continue its growth. He declared that the United States can produce but cannot distribute in the proper manner.

Engineers, he said, have built up an industrial machine but that no one can operate it.

Electrical Men to Venture Into Idaho Wilds in Game Quest

Carrying out their policy of an annual expedition to the wilds, seven members of the electrical industry on the Pacific Coast will start on a hunting and fishing trip along the Salmon River in Idaho, the latter part of this month. A boat is being built for the hunters and fishers at Salmon City and the party plans to float down the Salmon as far as Lewiston.

The men who will make the trip are: H. E. Sanderson, of the Bryant Electric Company; C. R. Bach, of the Manhattan Electric Supply Company, both of San Francisco; F. N. Averill and C. M. Will, of Fobes Supply Company, Portland; O. B. Stubbs and S. W. Peterson, of the Stubbs Electric Company, Portland, and R. W. Littler of the West Coast Engineering Company, also of Portland.

The members of the party have announced that orders for wild meat will be received at the headquarters in Portland and orders will be filled in the order they are received.

Industrial Electric Heating to Be Discussed by Society

Two of the technical sessions of the American Electrochemical Society, to be held in Montreal, September 21 to 23, will be devoted to a symposium on Industrial Electric Heating. There will be papers on the proper selection and properties of resistor materials, methods of handling materials in electric furnaces, and a discussion of the proper design of furnaces for industrial heating.

COMING EVENTS

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS
Annual Meeting—San Francisco, Calif.—September 23-25, 1922

NATIONAL ASSOCIATION OF RAILWAY AND UTILITY COMMISSIONERS
Annual Convention—Detroit, Mich.—September 26-30, 1922

AMERICAN SOCIETY OF CIVIL ENGINEERS
Annual Meeting—San Francisco, Calif.—October 4-8, 1922

INVESTMENT BANKERS ASSOCIATION OF AMERICA
Annual Convention—Del Monte—October 7-11, 1922

NATIONAL ASSOCIATION OF ELECTRICAL CONTRACTORS AND DEALERS
Annual Convention—Cincinnati, Ohio—October 9-14, 1922

Civil Engineers to Hold National Meeting in San Francisco

Hydroelectric development will be the subject of the coming meeting of the American Society of Civil Engineers, which will be held at San Francisco during the first week in October, and which will be attended by prominent members of the profession from all parts of the country.

Special interest attaches to this meeting because it marks the abandonment by the society of its time-honored policy of holding but two general meetings during the year, the "annual meeting" held in January at the New York headquarters, and the "annual convention," largely social, at some selected point. Of the fifty-one conventions that have been held, up to the present time, only four were at Pacific Coast cities, two in San Francisco, in 1896 and 1915, and one each at Seattle and Portland, in 1912 and 1920 respectively.

Beginning with the present year, however, the society has adopted a plan similar to that followed by the other national engineering societies, and is holding four meetings per year, at various points throughout the country. That San Francisco should be selected as the place for one of the first meetings under the new plan is significant of the growing country-wide recognition of the importance of the Pacific Coast.

All sessions will be held at the Palace Hotel. Preliminary meetings of the board of direction of the society will be held Monday and Tuesday, October 2 and 3. The general meeting of the entire society will be formally opened Wednesday morning, John A. Britton delivering the address of welcome. Technical sessions will be held Wednesday morning and evening and Thursday morning. Among the prominent visitors who will deliver addresses are A. P. Davis, director of the U. S. Reclamation Service and former president of the society, who will discuss the Boulder Canyon Project, and F. E. Matthes, of the U. S. Geological Survey, who will talk on surveying and map making by airplane.

Wednesday and Thursday afternoons will be devoted to excursions to nearby points of interest. Thursday evening there will be a dinner and smoker, at which Professor Charles D. Marx, head of the department of civil engineering at Stanford University, will preside.

The remainder of the week will be devoted to an excursion to Hetch Hetchy, leaving San Francisco Thursday evening at the conclusion of the smoker. The party will arrive in the mountains the following morning and will spend Friday and Saturday in going over the various parts of the Hetch Hetchy work, visiting also the Don Pedro dam, now being built by the Modesto and Turlock irrigation districts.

The Electric Club of Seattle recently elected the following officers: W. E. Jones of the Economy Fuse and Manufacturing Company, president, to succeed J. J. Agutter of the J. J. Agutter Electric Company; George Reininger, Globe Electric Company, vice-president; Rush McCargar, Rush McCargar Electric Company, secretary, and George R. Cooley of the Cooley Electric Company, treasurer.

Professor Harris J. Ryan, head of the department of electrical engineering, Leland Stanford, Jr., University, is being advocated for the post of president of the American Institute of Electrical Engineers in recognition of his brilliant attainments in the engineering field. Professor Ryan for many years occupied the chair of electrical engineering at Cornell University, Ithaca,

PROFESSOR HARRIS J. RYAN

N. Y. In his early days important patents were awarded to him, notably in conjunction with M. E. Thompson for the Thompson-Ryan equipment and for repulsion and interpole motors. Since he has been at Stanford University, Professor Ryan has acted in a consulting capacity for many of the large hydroelectric systems of the Pacific Coast. He has also done important research work in connection with high-tension insulation. During the Panama-Pacific International Exposition in San Francisco in 1915, he served as honorary vice-president of the A.I.E.E. on the Pacific Coast.

Markham Cheever, chief engineer and general superintendent of the Utah Light and Power Company, has been named chairman of the Water Power Development Committee of the Salt Lake City Commercial Club and Chamber of Commerce. Other members of the committee are **R. R. Lyman, E. H. Eardley, Lafayette Hanchett, H. B. Waters** and **A. M. Jackson.**

E. W. Rice, honorary chairman of the board of directors of the General Electric Company, with headquarters at Schenectady, is a recent San Francisco visitor.

Calvin W. Rice, secretary of the Amercian Society of Mechanical Enginneers, is the official representative of that organization to the International Exposition to be held at Rio de Janeiro this fall. Mr. Rice goes to the exposition as honorary vice-president of the society.

R. H. Ballard, vice-president and general manager of the Southern California Edison Company, **John A. Britton,** vice-president and general manager of the Pacific Gas & Electric Company and **William H. McGrath,** vice-president of the Puget Sound Power Light Company, are the western members on the public policy of the National Electric Light Associatiion which has just been announced by President Frank W. Smith.

Personals

James D. Blackwell, Seattle, president of the Northwest Society of Engineers, has been appointed city engineer of Seattle, to replace **A. H. Dimock,** who has been in office since 1911. Mr. Blackwell came to Seattle in 1899 for Stone & Webster interests, and aided in laying out a part of the city railway system. Since 1905, he has been associated with H. D. Hanford in general engineering practice.

C. E. Skinner, assistant director of manufacturing of the Westinghouse Electric & Manufacturing Company, during a short stay in San Francisco in connection with an inspection trip of the West, gave an interesting talk on the subject of "The National and International Engineering Standards Committee" before the Engineers' Club of that city. **C. E. Heise,** district manager for the Westinghouse company, acted as chairman of the meeting.

W. L. Johnson, formerly with the Southern California Edison Company and the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company, is now connected with the Los Angeles office of the Westinghouse Company in the capacity of automatic control specialist.

J. G. G. Kerry, hydroelectric engineer of Toronto, Canada, has been appointed consulting engineer for the city of Vancouver in connection with the establishment of a municipal hydroelectric plant in that city. The council has already secured options on a number of prospective water power sites in that vicinity and it will be Mr. Kerry's first duty to investigate these sites with a view of reporting on the one which is best suited for the city's purposes.

Bernard H. Linden, assistant radio inspector in the California district, has gone to Seattle to take charge of the northwestern office during the absence of O. R. Refern, inspector in that district, who is making an inspection trip throughout Oregon and Washington.

Kempster B. Miller, one of the principal stockholders of the Bend Water, Light and Power Company of Bend, Ore., is transferring his headquarters from the Middle West to Bend in order to be in closer touch with the activities of the company.

E. C. La Rue of the water resources branch of the U. S. Geological Survey, **A. P. Davis,** director of the United States Reclamation Service, **R. E. Caldwell,** state engineer of Utah, **Dr. John A. Widtsoe,** consulting engineer and **Clarence C. Stetson,** secretary of the Colorado River Commission, recently completed a trip by boat through 120 miles of the Colorado River Canyon between Halls Crossing and Lee's Ferry. The party inspected the entire 120 miles of canyon with a view of determining upon the possible damsites on that section of the Colorado.

H. C. George, oil recovery engineer of the San Francisco office of the United States Bureau of Mines, has returned to San Francisco from a two months' trip to Alaska.

J. G. Miles has been appoined manager of the central station division of the Seattle office of the Westinghouse Electric and Manufacturing Company, and will have general supervision of the sale of supply apparatus in that district in the future. Other changes in the personnel of the Seattle office of that company include the appointment of **A. W. Eshelby** as manager of the transportation division and **A. A. Miller** as special representative of the Company in large negotiations and power developments.

Edward C. McCarthy has been appointed treasury and accounting representative for the Westinghouse Electric and Manufacturing Co. at its San Francisco office. Mr. McCarthy replaces **A. L. Austin,** who has resigned.

B. C. Watts, one of the Denver jobbers, is on his annual trip to the Pacific Coast.

R. A. Balzari, manager of the industrial division of the San Francisco office of the Westinghouse Electric and Manufacturing Company acted as the representative of the San Francisco Electrical Development League and the California Cooperative Campaign at the meeting of the representatives of electric clubs, and cooperative organizations held at Association Island, N. Y., under the direction of the Society for Electrical Development Inc. While in the East Mr. Balzari visited the main works of the Westinghouse company at East Pittsburgh.

Fred Norcross, secretary and general manager of the Home Gas and Electric Company of Greeley, Colo., retiring president of the Colorado Electric Light, Power and Railway Association, presided over the sessions of that organization at Glenwood Springs on September 11-13 in conjunction with the Rocky Mountain Division of the N.E.L.A. The joint convention was one of the most successful in the history of the two organizations. Mr. Norcross'

FRED NORCROSS

connection with the electrical industry of the Intermountain region dates to 1913 when he left the position of trainmaster and assistant superintendent of the St. Louis and San Francisco R.R. to take over the duties of manager of the central station of the Home Gas and Electric Company at Greeley. He was later appointed to the post he now holds with the company.

J. H. Crossley, electrical engineer of Manchester, England, recently spent considerable time in California visiting the various noteworthy hydroelectric developments in that state.

David T. Mason, consulting forest engineer of Portland, is a recent San Francisco visitor.

F. E. Blake, treasurer and manager of the Hawaiian Electric Company of Honolulu, recently visited San Francisco. Mr. Blake came to the Coast to transact business for his company.

Frank L. Blanchard, publicity director for the City Service Company of New York recently inspected all of the Colorado holdings of the Doherty interests, including the developments of the Denver Gas and Electric Light Company.

J. H. Beaufort of the National Stamping and Electric Company of Chicago, is on the Pacific Coast investigating markets and making preparations to get the line of electrical appliances manufactured by his company properly established.

H. V. Bozell, editor of Electrical World, who has been spending some weeks visiting various cities of the West has returned to his headquarters in New York.

Theodore Waage, secretary of the Waage Electric Company of Chicago, is making a tour of the Pacific Coast cities in the interests of his company.

Earl Browne, member of the contracting firm of Browne-Langlais of San Francisco, has been re-elected president of the California State Association of Electrical Contractors and Dealers for the coming year. The problems faced by the association during the coming year are monumental and the election of Mr. Browne to the presidency is recognition of his associates' confidence in his leadership. Mr. Browne has been associated with the San Francisco contractor-dealers since 1907. In that year he joined the Electric Appliance Company where he was

EARL BROWNE

employed for two years. Subsequently he was with the Dunham Carrigan & Hayden Company and the John G. Sutton Company. Three years ago he organized the firm of Browne-Langlais, electrical contractors. He has been active in the affairs of the San Francisco Electrical Development League and also in the California Electrical Co-operative Campaign.

Dr. L. A. Bauer, in charge of the government non-magnetic ship "Carnegie," recently arrived in San Francisco from Australia where he has been supervising the construction of an observatory similar to that in Washington, D. C. The observatory has been constructed for the purpose of studying certain electrical disturbances under the surface of the earth. During May these disturbances were such as to partially cripple the electrical distribution lines throughout the southwestern portion of Australia.

Earle Remington, architect and signal engineer of Los Angeles, recently returned from Chicago where he attended the convention of the International Electric Protective Association. The newly organized association includes all important manufacturers of electric burglar alarms and watchman patrol services in the United States and Canada. Mr. Remington was elected to the position of vice-president of the organization during the convention. He is the only Pacific Coast representative on the executive committee.

J. B. Colesworthy, graduate of the University of Washington, who completed his training as an apprentice at the Westinghouse Electric & Manufacturing Company's East Pittsburgh Works, is now connected with the industrial sales organization of the Los Angeles office.

J. A. Lighthipe, chief electrical engineer, Southern California Edison Company, has gone East to attend the Edison Pioneers Convention at New York City, which will celebrate the 40th anniversary of the opening of the Pearl Street Station.

Frank LeRoy Blanchard, director of Cities Service publications and advertising, is visiting the Doherty properties in the West in order to obtain a working knowledge of all individual company problems. He addressed a meeting of the Rocky Mountain Committee on Public Utility Information in Denver, August 23.

H. B. May of the General Electric Company has just arrived from Schenectady, New York, and is now with the Los Angeles office of the company handling motion picture equipment.

Mires F. Size, formerly with the Martin Electric Company of Denver, agent-jobbers for the Edison Electric Appliance Company in Colorado, is now associated with the Edison Electric Appliance Company in Los Angeles as heavy duty specialist and will be in charge of the heating appliance campaign in southern California for that company.

Colonel Henry M. Byllesby of Chicago, head of a large number of middle western and western public utilities, is a recent San Francisco visitor. Colonel Byllesby came to California for the purpose of conferring with officials of the Western States Gas and Electric Company of Stockton, of which he is the president. This company is at present engaged in developing a large hydroelectric project on the American River in the Sierra Nevada mountains.

Wigginton E. Creed, president of the Pacific Gas and Electric Company, is making a short business trip to New York and other Eastern business centers.

Walter C. Heston, formerly Industrial Power Engineer with the Portland Railway, Light and Power Company, of Portland, Oregon, has been appointed Pacific Coast Editor of Electrical World with headquarters in San Francisco. He will assume his new duties on September 15. Mr. Heston comes to the Electrical World staff after 11 years of experience in electrical engineering

WALTER C. HESTON

fields and 3 years' editorial work as editorial representative for the Journal of Electricity and Western Industry and Electrical World at Portland. His early electrical engineering training was received at Benson Polytechnical School at Portland, after which he became identified with the Portland Railway, Light and Power Company. His work with that company has been particularly in the electrical distribution engineering field where he was for two years superintendent of distribution. In 1919 he became Industrial Power Engineer in the commercial department of the same company, which position he held until the present time. Mr. Heston served two years on the hydroelectrical and technical committee of the Northwest Electric Light and Power Association and has just completed a term as chairman of the Portland Section of the American Institute of Electrical Engineers, and his many years of activity in association work gives him a wide acquaintance in the electrical industry of the Northwest.

Lawrence Davis, a special representative of the National Electrical Contractors' Association, and **Kenneth McIntyre,** a representative of the Society of Electrical Development, were the guests of honor and the principal speakers at a special meeting and banquet held in the L. C. Smith Bldg., Seattle, recently, under the auspices of the Seattle Electric Club. The meeting was attended by practically every man of the electrical industry in Seattle.

Chas. D. Kunkel, power apparatus specialist of the Western Electric Company of Los Angeles, has just left for Association Island, New York, to attend the Western Electric Company's power apparatus conference. While in the East, Mr. Kunkel will visit the various plants of the company and will spend about a week at the main plant at Hawthorne, Illinois, which employs some thirty thousand people.

H. B. Broughton of the Illinois Electric Company of Chicago, has just arrived in Los Angeles to take over the Apex-Rotarex department of the Illinois Electric Company of Los Angeles. Mr. Broughton was with the Illinois Electric Company of Chicago from 1913 to 1919, going from there to the Northwest where he was Apex-Rotarex representative for three years. After that he was with the Chicago company prior to assuming his present duties.

The Cutler-Hammer Manufacturing Company, Milwaukee has placed on the market a standard line of starters and controllers for use in public and office buildings, theaters and schools. Heretofore this class of control equipment differed somewhat to each set of specifications and were not offered as a standard line. The new types are based on many years of experience in designing equipment of this type and are suited for many varied applications. The controllers and starters are enclosed and are free from both fire hazard and injury to the operator. Manual or automatic controllers are made for all kinds of motors, both adjustable and constant speed, a.c. or d.c.

The Cutler-Hammer Mfg. Co., of Milwaukee, has standardized a motor drive and automatic economy switch for typesetting machines. Motors of 1/3 hp. of either d.c. or a.c. design are furnished and are controlled by the automatic switch for cutting off the current and stopping the motor after a predetermined time, of from one to three minutes, if no work is being done on the machine. Performance records kept in plants using the equipment show a saving in current for the typesetting machines as high as 44 per cent. The equipment may be secured for either new or old machines.

The National X-Ray Reflector Company, Chicago, announces that its western district offices have been moved from 804 Security Building to 631 Pacific Finance Building, Los Angeles. Offices have recently been established in San Francisco at 902 Monadnock Building. The San Francisco offices will be in charge of H. C. Barnard, sales engineer.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is distributing Publication No. 4249-A, describing its line of insulating and soldering compounds. Some of the materials treated in the publication are baking varnishes, air-drying varnishes, insulating compounds, finishing materials, insulating glue, soldering flux, and lubricating oil.

The F. W. Wakefield Brass Company, of Vermillion, Ohio, has issued discount schedules on commercial lighting hangers, readjusted as of September 1. The lower prices will affect "Red Spot" standard hangers, ornamental hangers, and general purpose hangers, of both suspension and ceiling types.

The Kuhlman Electric Company of Bay City, Mich., has just issued Bulletin No. 113, which describes the new Kuhlman disconnecting type series-multiple transformer for street lighting. The new transformer is one which does not require splicing when connecting and it is absolutely self-protected from water and the elements, making it particularly valuable for street lighting work.

Manufacturer, Dealer, and Jobber Activities

The Illinois Electric Company, of Los Angeles, has been reorganized with the following officers: C. B. Hall, president; H. E. Sherman, vice-president and sales manager. S. W. Murray, formerly assistant secretary-treasurer, is now secretary-treasurer, and J. R. Keller, auditor, is now assistant secretary-treasurer.

The Electric Furnace Company, of Salem, Ohio, manufacturers of the Baily Electric Furnace, have issued two folders, which contain statements of users of their furnaces. Along with the statements are illustrations of the furnaces in actual working conditions. The uses of the various types of furnaces constructed by the company are also announced in the folders.

The Jewell Electrical Instrument Co., of Chicago, has recently added so extensively to its line of electrical measuring instruments that it became necessary for it to issue an entirely new catalog. Each instrument is clearly illustrated and its applications, size, scale length, accuracy and general characteristics described in detail. In the back of the catalog detailed dimensional drawings are shown of each instrument together with full size scales and complete listing of readings and prices. The sales department of the Jewell Electrical Instrument Company is revising their entire mailing list and it is their wish that every electrical engineer and user of electrical measuring instruments send his name asking for a catalog. They are also preparing to send out their 1922-23 leather vest pocket "Jot-book" covers. The Jewell "Jot-book" or vest pocket memorandum pad, with monthly calendars and filler pads, has become an established and permanent feature of Jewell publicity.

The General Electric Company has recently issued Bulletin No. 47606, describing relays, their application and operation. The bulletin describes numerous arrangements where special types of relays are used. In the back of the bulletin, a table of applications of standard relays gives a general idea of the different types and applications of the more common relays.

The Crooks-Nelson Household Appliance Co. of Denver, the largest exclusive appliance store in that city, has closed its retail store at 1648 California St.

Radio Special, 1515 Cheyenne Place, Denver, Colo., has been opened as an electrical retail store, featuring radio equipment. Harry Carlson of the Carlson Ice Cream Co., and D. H. Irions, formerly of the Electrical Review staff of the International Trade Publishing Company, are the owners of the new store.

The Walsenburg Electric Supply Co. at Walsenburg, Colo., has been organized as a retail store by Harold J. Reed, A. H. Carey and T. A. Dickey.

The Eastern Utah Electrical Supply Co. of Price, Utah, has established a branch at Grand Junction, Colo., with Glen Nelson in charge.

The Denver branch of the **Western Electric Co.** and the **Denver Gas and Electric Light Co.**, early in September started a sales campaign on washing machines which is proving one of the most comprehensive undertakings in this line in the Rocky Mountain territory for several years. Considerable advance advertising was done leading up to the campaign. Sufficient time has not elapsed to estimate the amount of business obtained, but it is generally believed that a record will be established. F. E. Hazard, director of sales of the Conlon Electric Washer Co. of Cicero, Ill., made a trip to Denver to help develop the campaign.

The Eastern Utah Electric Company of Price, Utah, will shortly move into larger and more commodious quarters in a new building which is being constructed by them on Main Street. With this additional room augmented by a large warehouse on North Ninth Street, the electric company will greatly increase its various lines of electrical goods. The new store will be divided into departments. The company was organized three years ago and at the present time is doing a wholesale business over the whole of eastern Utah and western Colorado.

The Electrical Supply and Construction Co. of Denver has relinquished its contracting department, according to W. J. Keating, the manager, in order to develop the jobbing and manufacture of a medium priced line of lighting fixtures.

VISITORS

Before the month is out the entire electrical industry here in the West will have met these two genial gentlemen from the East. He on the right is Laurence W. ("Larry") Davis, field representative for the National Association of Electrical Contractors and Dealers. His smiling Scotch partner is Kenneth A. McIntyre, field man for the Society for Electrical Development, Inc. We know a good one on Kenneth. He lived in the West when a lad, later moving East. At the age of eleven, he decided that Rye, N. Y., could not compare with California, so one evening he took his young brother and sister and headed West. The police caught him before he got very far. He is back to the West for the first time since then.

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

SAN FRANCISCO

Business conditions in San Francisco and northern California in general, show a particularly favorable trend toward better conditions. The usual summer slump was much lower this year than it has been for some time and this fact seems to augur a particularly busy fall period.

Building permits have increased greatly over the last month, the valuations being doubled. Many new school buildings, large apartment houses and substantial residences are being built both in and around San Francisco.

The sugar pine industry near Fresno is to receive the benefits of a new railroad which is now under construction. Cement is in such demand that four of the large producing companies are behind in orders by at least 1,000 cars. There are also several large public utility enterprises which are increasing this demand for cement.

The closing out of summer stocks is the feature in the retail trade and the jobbers in all lines report business good and increasing. The volume of sales exceeds that of last year.

The movement of general freight is still slow, but the favoring of fruit shipments by embargo, has aided this industry to some extent. The aid has not been as much as might be expected, however, as western railroads have, in the past, given this same preference to the fruit men. However, the freight movement condition is causing only inconvenience and is not critical.

PORTLAND

Although the rail strike has not had any drastic effect upon business as yet, it is certain if it continues much longer serious inconvenience and loss will be caused to shippers, particularly apple growers. Lack of cars has already caused a slump in the lumber shipments and a great deal of lumber for domestic markets is being diverted to water carriers.

The building activity continues and from all indications a record in valuations of permits will be established this year.

Electrical jobbers and contractor-dealers report business good.

DENVER

Despite the fuel shortage, transportation difficulties, and the attendant dullness of the mid-season business, conditions in this section of the West are far better than is generally believed. This is evidenced by a resume of the bank clearings in Denver for the first eight months of the year and it shows almost a steady increase each month, totaling over fifty million dollars more than for the same period in 1921.

Building of dwellings and industrial structures is keeping up. Nearly every community of any size in this district is making some municipal improvement. Railroad service is getting better and should relieve the situation found in the fruit producing sections of the state. According to reports, agricultural prospects continue satisfactory and increasing activity is noted in the metal mining regions.

Stimulation is still being applied in liberal doses to retail sales in nearly all lines. Electric appliance sales are at a low ebb. Lighting fixture business is fair. Transmission material and heavy duty equipment is much in demand.

SALT LAKE CITY

Reduction in freight rates between Salt Lake City and California Pacific Coast points, on several commodities, is an important recent development in the business situation in the intermountain section. Packing house products, canned goods, chocolate, cocoa, and zinc oxide are the commodities involved up to the present time. This is considered a very important move in the right direction for stimulating production.

Mining activity continues to increase, and this industry is more active than for some months past. Production of copper by the Utah Copper Company, Chino, Ray Consolidated and Nevada Consolidated companies, which resumed work last April after a year's shutdown, shows a steady increase from month to month.

Retailers report, as a rule, greater sales than for the corresponding period of last year, although business in most lines is somewhat slow, with the exception of lumber and building material.

The railroad strike situation is having a retarding effect on business in general.

Electrical appliances are moving fairly, but there is still room for improvement.

It is expected that the Rocky Mountain Electrical Exposition, to be held at Salt Lake City this fall, will introduce many educational features which will have a decidedly favorable effect in increasing the use of electricity in industry and in the home, which will mean, of course, increased activity among the elcetrical people.

SEATTLE

Though handicapped by a scarcity of logs and a car shortage, mills reporting to the West Coast Lumbermen's Association cut, sold and shipped more lumber in the last week in August than for several weeks previous. Sales showed a sharp increase, from 72,528,987 ft. of the week previous to 83,154,728 ft. Production was 4 per cent greater than normal. An increase in the percentage of water shipments indicates that shippers are looking for an outlet by water, while the railroads are handicapped by the shopmen's strike and the shortage of cars at this season of the year.

The fact that the harvesting of crops is at its height and is requiring a large amount of railroad equipment has further complicated the situation, and crop-growers, especially in the apple centers, are being seriously delayed in shipment of their fruit.

The log shortage, caused by the forest fires during the long dry spell, is being removed to some extent, due to the resumption of activities in many camps following the rainy weather of the past two weeks.

Retailers and dealers report a very satisfactory volume of business during August. Electrical men are very much interested in the coming Electric Week and are preparing to capitalize to the fullest extent the publicity attendant upon it.

LOS ANGELES

Los Angeles continues well up in the lead in building activities of all cities in the United States, ranking fifth for the month of July and third for the first seven months of 1922, being surpassed during this period by only New York and Chicago. For the month of August there were 4,294 building permits issued with an estimated valuation of $11,523,890 which represents a considerable increase over the previous month with an estimated valuation of permits issued of $8,064,018.

The attention of the electrical men in Los Angeles and vicinity has been attracted to the Electrical Section of California's Pageant of Progress and Industrial Exposition, where the most comprehensive display of electrical apparatus and appliances ever witnessed in southern California is being held. There are demonstrations of all types of electrical labor-saving and heating appliances, industrial apparatus and lighting exhibits, as well as a free electrical cooking school which is being conducted by the Home Economic Department of three of Los Angeles' leading newspapers, under the auspices of the California Electrical Cooperative Campaign.

The demands for electrical apparatus and appliances continues and electrical men in this section are generally pleased with the excellent business that has maintained throughout the summer months and are anticipating a very good fall business.

The railroad strike has had no marked effect on business in this section even though shipments are long overdue and there is a slight scarcity in some lines.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

Bridges

Cal., Sacramento—Jenkins and Elton, Sacramento contractors, have been awarded contract for construction of the Portola bridge, Plumas county.

Cal., Los Angeles—A concrete viaduct 1,900 ft. long to cost approximately $200,000 will be constructed as the main feature of outer harbor boulevard project, according to plans approved by Harbor Commission.

Cal., Los Angeles—The board of harbor commissioners has advertised for bids to be opened Sept. 28 for the new steel bridge to connect Terminal Island with the mainland at Badger Avenue. The cost is estimated at $750,000, approximately $400,000 of this amount being for steel work.

Cal., Sacramento—A contract for the construction of a reinforced concrete girder bridge across the San Gabriel river near Azusa, in Los Angeles county, was awarded by the state highway commission to D. A. Foley and Company of Aitkin, Minn. The amount is $124,088.70. Engineers of the commission estimated the cost of the bridge at $146,966. The new structure will replace an old bridge which is now in use, though there is to be a slight change in the location.

Cal., Los Angeles—Bids are being taken by the Los Angeles harbor commission for constructing the Strauss double leaf bascule bridge which is to span the channel between Terminal Island and the mainland. The bridge will be 620 ft. over all. The main span will be 220 ft. with a clearance of 188 ft. between piers, and there will be a 50-ft. tower span and 150-ft. approach span at either end. The superstructure will be 78 ft. wide, with a double railway track in the roadway and a 6-ft. walk on either side for pedestrians. The four piers, which are now being built by the Ross Construction Company, will be 80 x 24 ft. at the base and extend 80 ft. below the water level. There will be 4,540,000 lb. of steel and 400,000 lb. cast bronze and other metals in the superstructure. The total cost is estimated at about $750,000, of which $234,000 will be expended upon the substructure.

Cal., Los Angeles—County Bridge Engineer Armstrong is preparing plans for a concrete bridge across the mouth of San Gabriel river at Alamitos Bay. It will consist of ten 30-ft. spans and one 42-ft. span, with concrete piles and abutments. Another bridge project ordered by the supervisors is a structure of type yet to be determined, across a slough opening into Alamitos Bay, east of the San Gabriel river mouth, on the state highway, not far from the county line. It will be approximately 200 ft. long. Plans will also be started shortly for a concrete bridge across the mouth of Topango canyon, on the coast highway. It will consist of four 54-ft. spans, with concrete piers and abutments on piles.

Ore., Portland—The following bridge contracts have been let by the state highway commission: Gilliam county—Oregon-Washington highway; two concrete bridges over Willow creek near Heppner junction; Tobin & Pierce, $12,855. Lincoln county—Newport-Corvallis highway; steel span over Yaquina river; Union Bridge Company; $11,462.50. Linn county—Pacific highway; wooden span across Calapooia river; E. V. Olds; $13,362; referred to county for consideration. Yamhill county—McMinnville-Tillamook highway; steel span over Willamina river; Marshall & Barbur; $11,434.15; awarded subject to approval of county.

Ore., Salem—The state highway commission has announced the awarding of the contract for the construction of a concrete arch bridge across the North Umpqua river on the Pacific Highway, to H. E. Deering of Portland. There are to be seven arches and the bridge is to be about 100 ft. in length. The cost will be about $125,000, the county, state and government sharing the expense.

Ore., Portland—Contract for surfacing the Mount Hood loop in Clackamas county, a distance of approximately 10 miles, has been let by the state highway commission to A. D. Kern.

Wash., Seattle—All bids for the construction of superstructure of the Spokane Street bridge, estimated to cost $1,250,000, scheduled for opening August 25, were returned unopened by the city council, and a new call for bids to be opened October 6, issued. New specifications will be issued. Structure consists of a 288-ft. double leaf bascule steel bridge, with two 140-ft. fixed span approaches. Bridge will be 45 ft. wide, with room for two car tracks and 6-ft. sidewalk. Principal quantities involved are 3,760,000 lb. of structural steel, 351,000 lb. of machinery and 8,750 yd. of concrete in counterweight.

Wash., Anacortes—The Anacortes Pile Driving Co. has secured the contract for rebuilding the Swinomish bridge.

Buildings (Industrial)

Cal., Santa Barbara—Frank Henderson, supervision architect of the James L. Stewart Company, has brought to Santa Barbara plans for a factory to be erected by the Sears-Roebuck Company. Plans have been approved by Frank Siegel, a director of the company. H. Thompson, superintendent of construction for the Stewart company, will arrive shortly and it is expected that work will begin at once. The plant which will employ over 500 workers, will cost about $800,000. It will consist of four buildings, each 125 x 175 ft. It is also stated that Mr. Siegel, owner of several hotels in Chicago, plans to build a large hotel in this city.

Cal., Los Angeles—Architect W. J. Saunders, 227 Laughlin Building, has prepared plans for a 4-story and basement, Class C furniture warehouse for Barker Brothers, to be erected adjoining the present buildings at Hewitt and Palmetto Sts. Concrete basement and first floor slab, 120 x 130 ft., reinforced concrete exterior walls, mill construction floor, composition roofing, steel sash, metal skylights, elevator, automatic sprinkling system, maple finish floors. Work will be done by subcontract or day work.

Cal., Los Angeles—The Santa Fe Railway is having plans prepared by its engineering department for an addition to the ice plant at Bakersfield and for a new ice plant at Needles. The buildings will be of reinforced concrete construction and will cost about $150,000 each.

Cal., Los Angeles—Architects John Parkinson and Donald B. Parkinson, 420 Title Insurance Bldg., are preparing plans for an additional unit to the terminal warehouse buildings at 7th and Alameda Streets for L. A. Union Terminal Company. It will be a 4-story and basement, 100 x 560 ft., reinforced concrete, class A construction, flat slab system, stucco exterior, steel sash, steel rolling doors, elevators, conveyors, sprinkling equipment; $500,000.

Cal., Los Angeles—Architect Albert C. Martin, 430 Higgins Building, and Frank L. Stiff, associate architect, have prepared preliminary plans for the first unit of a large factory to be erected at San Pedro for Pacific Coast Borax Company. It will be a 2-story, 250 x 400 ft., steel frame, brick walls, reinforced concrete floors, elevators, etc. The building is designed for 5 stories.

Cal., Pomona—Teetor Adding Machine Company will purchase a site next week and will build a factory for the production of adding machines, at Pomona. The factory, upon which work will be started at once, will contain about 50,000 sq. ft. floor space. The entire project will cost about $200,000, part of which is being raised by local subscription. C. J. Carr and J. A. Heaton, of the company, have been in Pomona for some time arranging for the proposed enterprise. The Chamber of Commerce has appointed a committee to aid in the matter.

Cal., Los Angeles—Architect John M. Cooper, 335 Marsh-Strong Building, has prepared plans for a group of factory buildings at Slauson and South Park Aves. for Jacob H. Jonas, Class D construction, 100 x 200 ft., 60 x 80 ft. and 50 x 150 ft. respectively; redwood and corrugated iron siding, composition roofing, plaster front on one building, cement floors; $35,000.

Cal., Anaheim—G. E. Fickett, 638 S. Western Ave., has been awarded a contract at $160,000 for erecting a five-story Class A warehouse at the plant of Anaheim Sugar Company, between Anaheim and Fullerton, for Arthur Peck. Reinforced concrete construction, 44 x 260 ft., composition roofing, metal frames and sash, metal skylights, two elevators.

Cal., Los Angeles—Plans for the enlargement of the plant of the Pacific Ready-Cut Homes, Inc., are under consideration and it is expected that within the next year an expenditure of $150,000 will be made for the enlarged factory, which will include new cabinet shops, additional electric loading cranes, sash and door factory, dry kilns, etc. Berne S. Barker is secretary of the firm.

Cal., San Francisco—The U. S. Metal Products Co., 330 Tenth Street, will erect a manufacturing plant adjoining the present quarters on Tenth Street. The structure will be of brick construction. Work on the foundation is under way. The selection of an architect to prepare plans for the proposed building is yet to be made.

Cal., Richmond—Announcement is made by L. E. Brown, president, and his associates of the Luning Minerals Reduction Company plant, that a factory will be erected on the site of the industry at Twenty-first Street and Santa Fe right-of-way. About $50,000 will be invested, it is said.

Cal., San Francisco—Construction work has started on a two-story and basement, concrete, fireproof factory building and warehouse to be erected on the northwest corner of Fifth and Clementina Streets for Louis R. Lurie. The building is to be completed in 90 days and will represent an investment of $150,000.

Cal., Los Angeles—The Graham Construction Company is planning the erection of a ten-story, Class A loft building, especially designed to meet the need of light manufacturing con-

cerns, on property recently leased from Eric Fowler at 730-736 South Los Angeles Street.

Colo., Denver—The National Biscuit Company will shortly erect a new five-story factory at 19th and Market Streets, to cost approximately $400,000.

Ore., Hood River—Storage Plant—Oregon's cooperative agency of fruit growers is planning a three-story concrete storage plant to be built on the site of the original structure built 30 years ago, which is now being razed. The new plant will be an annex of existing plants extending for 800 ft. along the O. W. R. & N. line and will cost about $25,000.

Utah, Nephi—The Nephi Plaster & Manufacturing Company of Nephi will shortly begin several important extensions to its plaster mill and its Keene's cement department. Additional modern fine-grinding michinery will be installed and a complete new unit will be erected to prepare land plaster (agricultural gypsum) and crushed gypsum for the Portland cement trade. Larger storage facilities will also be provided.

Wash., Vancouver—Glass Factory—The Oregon & Washington Glass Company, a $500,000 corporation, announces that it has set aside $40,000 for the construction of a bottle factory in Vancouver.

Wash., Yakima—Meat Plant—Contract has been let for the construction of a $215,000 addition to the packing plant of the Yakima Meat Company, and work will start at once. A large quantity of machinery will be required.

Wash., Seattle—Telephone—The Pacific Telephone & Telegraph Company has purchased a site costing $100,000 on Lake Union, across from the Ford assembly plant, on which they will erect shops, warehouse, and garage, costing $100,000.

Wash., Aberdeen—The A. A. Star Transfer Company is planning the erection of a brick and concrete warehouse at Hume and M Sts., to cost approximately $40,000. Two stories will be built at the present time and two additional stories at a later date.

Wash., Seattle—Lumber Mill—Construction of a large sawmill and box factory by the Puget Sound Lumber & Box Company on Lake Union, to replace a plant burned one year ago, will begin immediately. J. W. Maxwell, president of the National City Bank, heads the Lumber Company.

Dams

Idaho, Parma—Work has started on the grading of a wagon road to Black Canyon, five miles northeast of Emmett, where the $1,200,000 government dam and power plant will be located. Reclamation officials in charge of the work announce that construction of the dam will move rapidly. Machinery, building materials and supplies of all kinds have been ordered. J. B. Bond, manager, and Engineer Ward are directing the work.

Highways

Cal., Sacramento—The state highway commission has awarded a contract for grading 3.25 miles of highway in Ventura county between the Hueneme road and a point 3¼ miles southeasterly, to the George Pollock Company of Sacramento on its bid of $33,640. The estimate was $26,074. A contract for 4.34 miles of asphalt and concrete surfacing in Santa Clara county between Carnadero Creek and the south boundary was awarded to the Clark & Henery Construction Company of Stockton. The Isbell Construction Company of Fresno received the contract to grade 11.31 miles between Chester, Plumas county, and Westwood, Lassen county. The bid was $116,227.50 as against the highway commission engineer's estimate of $114,721.50.

Cal., San Francisco—The board of public works has awarded to Healy Tibbitts Construction Company the contract for construction of the fourth section of the beach esplanade, extending from Cabrillo Street to a point below the Chalet, at approximately $54,000.

Cal., Fresno—County supervisors have just awarded a contract to T. A. Hanrahan of San Francisco for paving 10.14 miles of county highway on the Biola road at $16,666 per mile. The bid was almost $2,600 per mile under the engineer's estimate. County Surveyor Chris P. Jensen states this is the lowest bid for county highway work since the $4,800,000 good roads bond issue was voted by Fresno county. At this price the entire county highway system as originally planned could have been built within the amount of the bond issue.

Ore., Salem—B. W. Bartlett, of Corvallis, has been awarded the paving contract for the new Pacific highway through the town of Jefferson, in southern Marion county, at a cost of approximately $25,000.

Ore., Portland—Contracts for highway work in eleven counties have been awerded by the state highway commission, including the following: Hood River county—Mt. Hood loop, Hood River-forest boundary section, Unit No. 1, 9.17 miles, stone surfacing; Albert Anderson, $50,320; unit No. 2, 7.89 miles stone surfacing, Albert Anderson, $47,816.25; unit No. 3, 6.08 miles, rock surfacing, Rood & Josselyn, $36,931. Crook county—Ochoco highway, Prineville-Jones mill section; 17.3 miles rock surfacing; J. K. Shotwell, $44,815. Harney county—Central Oregon highway, Burns section; 4.2 miles grading and graveling; E. E. Larsen, $19,963. Lake county—Klamath Falls-Lakeview highway, Drewes valley section; 8.8 miles, grading and surfacing; H. J. Hildeburn, $102,525; Lakeview-Bend highway, Valley Falls-Chewaucan Narrows section; 12.3 miles gravel surfacing; H. J. Hildeburn, $36,318. Umatilla county — Cold Springs highway, Holdman-Harp's ranch section; 3 miles grading and surfacing; Carlson & Nyberg, $42,362. Oregon-Washington highway, Vinson section; 4 miles rock surfacing; General Construction Company, $17,880; to be completed in 1923. Newberg to Multnomah county line; 3.3 miles paving; Cummings & La Porte, $94,075.

Ore., Roseburg—Contract for construction of the Scottsburg-Mill Creek section of the Roseburg-Reedsport highway was let by the county court to A. C. Henson, contractor, on a bid of $52,378. The completion of this contract will finish the road to the coast, except for a gap of three and three-fourths miles on which government aid is being sought. This section lies between Mill creek and Brandy bar, mostly within the Siuslaw national forest. It is the most difficult part of the construction and will cost in the neighborhood of $180,000, in addition to $100,000 required for a bridge. The county will be able to provide about $80,000 for this section, having spent about $175,000 already for the work completed and under contract.

Ore., Portland—The Wallowa county court has let the contract for the Powwatka market road up Whisky Creek to the forest boundary to the Johnson Contract Company of Portland at $44,000. The road will be 5¾ miles long.

Wash., Wenatchee—The contract for building approximately six miles of the Sunset highway through Blewett Pass from Peshastin Creek to the forest boundary has been awarded to Burke, Sengfelder & Berry, Wenatchee contractors, on a bid of $49,300.

Wash., Seattle—Work is now under way on the contract for the paving of 4½ miles of the Kent-Orillia section of the Pacific highway. Albertson, Connell Bros. & Walsh of Tacoma are doing the work. Two concrete bridges will be constructed.

Wash., Olympia—The state highway commission will receive bids until October 3 for two highway contracts, as follows, the last to be awarded this year: clearing, grading, draining and surfacing with crushed rock 12¼ miles of the North Bank highway, between Underwood and Lyle, in Klickitat county; grading and draining 20½ miles of the Inland Empire highway between Umptanum and Selah, Kittitas and Yakima counties.

Irrigation Projects

Cal., Modesto—Sale of the electrical franchises for the Turlock irrigation district has been ordered advertised by the board of supervisors. Bids will be received up to 10 o'clock a.m., Sept. 25.

Cal., Oroville—Bids for the construction of the drainage system for Butte County Drainage District No. 200 were opened by the directors of the district in Oroville. W. W. Green of Biggs is president of the district. George Pollock Company, being the lowest bidder, was awarded the contract at 23 cents a yard on part of the system and 19 cents a yard on some of the ditches. His average was 21½ cents per yard.

Cal., Oakdale—Property owners in Oakdale irrigation district recently voted in favor of a special assessment of $50,000 for improvements on laterals, canals, ditches, extending irrigation water as far as the Griffin tract of 1,000 acres. A 600-acre tract near Riverbank will also be brought under irrigation and a $6,000 pipe line constructed through this city to replace the open ditch now used.

Idaho, Newdale—A contract for the enlarging and lining with concrete the main canal of the Canyon Creek irrigation district, embracing about 7,000 acres in the vicinity of Newdale, has been awarded to the Pocatello Construction Company of Pocatello, Idaho, at the contract price of $42,000. The work is to be started September 15 and completed within 100 days. Cotton & Wilson, of Idaho Falls, are the engineers in charge of the work.

Ore., Klamath Falls—A contract has been executed between the government and the Malin and Shasta View, Cal., irrigation districts, providing for the irrigation of 10,000 acres of land. Malin will be bonded for $100,000 and Shasta View for $120,000, to install pumping plants and build ditches. The government will furnish the water.

Wash., Wenatchee — Representatives of the Wenatchee Reclamation District and of the Washington Coast Utilities Company are working together to increase the supply of water delivered to the high line district, and contracts covering the work are being drawn up. The Washington Coast Utilities Company will be compelled to enlarge the upper end of the canal, which they own. The reclamation district must make provision to carry an additional supply of water by enlarging and changing its facilities. A proposal will be submitted to the water users later, which if voted favorably upon, will provide for issuance of bonds. The cost is estimated at $25 to $35 per acre, involving 12,000 acres.

Wash., Aberdeen—All bids for the improvement of drainage district No. 4, located on the southern edge of Aberdeen, and comprising 600 acres, were rejected, and new bids called for, to be opened September 15. The improvement is estimated to cost $90,000; the low bid was $82,080, but the length of time provided for completion was unsatisfactory.

Wash., Yakima — City commissioners have awarded contract for the construction of irrigation laterals in the district east of the Northern Pacific tracks and north of Pacific Avenue to S. A. Campbell of Sunnyside on his bid of $72,095.85.

Wash., Okanogan—The State Department of Conservation and Development, through the division of reclamation, is working on plans and specifications leading to the development of nearly 8,000 acres of agricultural land situated

between Tonasket and Loomis in Okanogan county. The department has agreed to purchase the necessary bonds, which will total approximately $600,000. The district now contains 900 acres under cultivation. A soil survey of the land projected for development shows it to be particularly favorable.

Power Plant Equipment

Colo., Boulder—C. A. Semrad, general manager of the Western Light and Power Company, a cities service subsidiary, has just returned from New York City with authority to improve the Lafayette plant of the company to the extent of several hundred thousand dollars provided sufficient water can be secured for the plant, which is the main steam plant of the company system. It is also announced that similar authority had been granted for improving the Cheyenne, Wyo., plant to the extent of $125,000.

Power Projects

Cal., San Francisco — Bent Brothers, 1714 Eagle Ave., Los Angeles, have been awarded contracts to construct the Bullard's Bar project in Yuba county for the Yuba development with offices in the Hobart Building, San Francisco. For the dam, Bent Brothers were awarded the contract at $330,680, and the power house for $12,974. The present Bullard's dam will be raised. Bids for the power house equipment are now being received by the owners, who also plan to construct 20,000 lin. ft. of roadway, 6.1 miles of transmission line, equipped with three copper wires, 2-gage, porcelain insulators, using 20 poles to the mile, carrying 60,000 volts. The Constant Angle Arch Dam Co., Hobart Bldg., San Francisco, is the designer.

Cal., San Francisco — The board of public works advised the public utilities committee of the board of supervisors that it had accepted a bid of the Westinghouse Electric and Manufacturing Company for transformers for the Hetch Hetchy project in the sum of $379,584, and asked that an appropriation be made by the supervisors in this amount. The committee sent the request to the finance committee with a favorable indorsement.

Mont., Dillon—L. K. Adams, manager of the Union Electric Light Company, has announced that his company will construct a transmission line to Sheridan for delivery of power purchased from the Montana Power Company. The cost is estimated at $50,000.

Utah, Brigham City—A new electric feeder line is being constructed by Brigham City from the new municipal power plant at the mouth of Box Elder canyon to Eighth West Street. The distribution system of the plant will be reconstructed in some parts of town in the very near future, and it is the intention of the city manager to ultimately rebuild the distribution system over the entire city in the course of time.

Utah, Salt Lake City—H. W. Taggart, of Williamsport, Pa., has applied to the state engineer of Utah for a permit to divert 20 cu. ft. of water from Center creek in Iron county. The water is to be used for the purpose of furnishing electric energy for light and power to Iron county.

Utah, Levan—The town of Levan has entered into a contract with the Big Springs Power Company of Fountain Green, Utah, for the furnishing of electric light and power to its citizens. Work is progressing rapidly on the building of transmission and distribution lines for this purpose. One year ago bonds to the amount of $16,000 were voted for the purpose of bringing electric service to the town.

Wash., Aberdeen—A contract for erecting 5.4 miles of 10,000-volt transmission and telephone line on the Olympic highway, starting at the city limits of Montesano and extending toward Aberdeen, has been awarded to E. C. Bates of Seattle by the Washington Coast Utilities Company. This line will connect with a similar one to be built from Aberdeen by Mr. Bates for the Grays Harbor Railway & Light Company and the completed improvement will supply current, furnished by the Grays Harbor Railway & Light Company to the customers of the Washington Coast Utilities at Montesano and Elma. Under arrangement, the line will be built jointly by the two companies.

Wash., Tacoma—The city council accepted by resolution the franchise granted the city last month by the Pierce county board for the construction and maintenance of power lines on and over certain county roads, as required for the Tacoma-Seattle intertie power line, the franchise to run for 50 years.

Wash., Stevenson—Contractor McKeighan has started the construction of a concrete power house on Hermon creek, above Cascade Locks, for the Skamania Light & Power Company. The plant furnishes light and power on both sides of the river and has lately extended its lines to Eagle creek and resorts along the river.

Street Lighting Systems

Utah, Ogden—The Ogden city commission has adopted a contract with the Utah Power & Light Company for the lighting of Eccles Avenue between Twenty-fifth and Twenty-sixth Streets.

Wash., Seattle—Assistant Corporation Counsel Donworth has completed draft of legislation providing for a $2,000,000 bond sale to finance extensions and betterments to the city light and power system, and bill will be introduced in city council.

Wash., Aberdeen—Business men of the city, with James Marlatt, chairman of the Chamber of Commerce committee, are considering plans for financing a boulevard lighting system in the city.

Railways

Ariz., Phoenix—Construction of 750 miles of electrified railway in Arizona is proposed in the near future by the filing of incorporation with the corporation commission by the Staley system of electrified railway, R. E. Grace and Carl A. Davis, Phoenix, and William L. Staley of Los Angeles. Theo. H. Lohman of San Diego and W. E. Bell of East Las Vegas, incorporators. The railway will start at Arizona and New Mexico state line and run to the Arizona-Mexico boundary line.

B. C., Vancouver—All railroad trackage on Industrial Island, a government owned industrial center in False Creek, Vancouver, has been electrified. The work of installing the poles and trolley lines has been completed by W. W. Fraser of Vancouver. All switching and hauling will be done under contract by the B. C. Electric Railway Co., Ltd.

Cal., Los Angeles—Pacific Electric Railway Company has submitted to the city council a proposition calling for a general street car and "bus" system for the city. The idea would include numerous extensions to railroad lines, costing about $125,000. The principal item would be $53,000 for an extension on Third St. line east on Montana Ave. to 17th St. The company was recently awarded a franchise for the purpose of construction of a $2,000,000 four-track subway tunnel back of Hill Street Station, between 4th and 5th Sts.

Cal., Los Angeles—A bond issue of $60,000 for repairing and extending the old wharf of the Southern Pacific Railway Company at Newport, was submitted at a special election, Sept. 11, in Municipal Improvement District No. 2, Newport Beach. The railway approach to the wharf is a high earth embankment and one of the first things that will be done if the city buys the pier will be to remove the embankment and continue the ocean front walk on one level. City control of the old wharf will contribute materially to the development of the entire beach.

Colo., Denver—The Denver and Rio Grande Western railroad through its receiver, Joseph H. Young, has been given authority by the United States court to expend $2,100,000 for improvements on various parts of its system. Replacement of rails on 250 miles of track will be the first work undertaken.

Colo., Denver—The Denver Tramway Company is planning to provide a street car line extending about one-half mile from the Globeville line to the new Burlington shops for the accommodation of workmen at the new C. B. & O. Railway shops. E. Stenger is receiver of the tramway company.

Utah, Salt Lake City—The initial contract for work to be undertaken in the development of Utah's iron deposits by the Columbia Steel Corporation has been awarded to the Reynolds-Ely Construction Company. The contract involves the grading for the Carbon County railroad, a branch line to the company's coal holdings in Carbon county, the grading for the tipple yards, construction of the gravity tram line and driving of a tunnel to open up the coal deposit.

Streets and Sewers

Ariz., Tucson—Resolution of intention has been adopted by city council for improving streets in northeast section of the city, including portions of Park, Tyndall, Euclid, Second, Third, First and other avenues, between Speedway and Drachman St., by grading, constructing curbs, and laying 8-in. and 10-in. vitrified pipe sewers. L. A. Cowan, city clerk, G. H. Atchley, city engineer.

Cal., Santa Ana—Bids will be called for within 15 days for construction of Santa Ana outfall sewer system. Plans and specifications are being prepared under direction of City Engineer W. G. Knox. The $321,000 bond issue for this work was purchased by Stephens & Company, Los Angeles.

Cal., Fullerton—City trustees have adopted a resolution declaring willingness of city to join with Santa Ana and Anaheim in constructing joint outfall sewer to ocean and treatment plant. A 42-in. main will be laid by Fullerton to the joint treatment plant and the city will pay 20 per cent of the cost of the joint works. Cost to Fullerton, about $200,000.

Cal., Merced—An election will be held soon to vote on an issue of bonds in the sum of $87,500, $70,000 of which will be used for sewer purposes and $17,500 for park improvements.

Waterworks

Cal., Compton—Ordinance No. 130, passed by city council, calls for the issuance of $75,000 bonds for a water system for the city of Compton.

Cal., El Segundo—The $200,000 bond issue for a municipal water system carried at a special election. The existing plant will be purchased and extensions and improvements will be made. Olmsted & Gillelen, Hollingsworth Building, Los Angeles, engineers.

Cal., Inglewood—A bond issue of $217,500 for water development will be submitted in October; $152,000 for new wells, pumping equipment, pressure mains, distribution mains and 100 fire hydrants; $55,000 for acquiring 55 acres where pumping stations are now located and fencing same; $7,500 for 2½ acres additional land.

Ore., Pendleton — Approximately $22,000 in paving contracts have been awarded by the city council to the Warren Construction Company.

Cal., Santa Monica—City council has ordered the construction of a 6-in. sanitary sewer in portions of Pico Blvd., Bay St., Sixth St., and Eighth St., with flush tanks, manholes, junction chambers and other necessary structures; 1911 Act.